Multi-WAN VPN Link Balancer

User’s Guide

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Document Version: 2.1

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1: Introduction

Congratulations on the purchase of your new Multi-WAN VPN Link Balancer. The Multi-WAN VPN Link Balancer not only provides a selection of 1~8 WAN ports – it also provides ***Shared Broadband Internet Access*** for all LAN users.

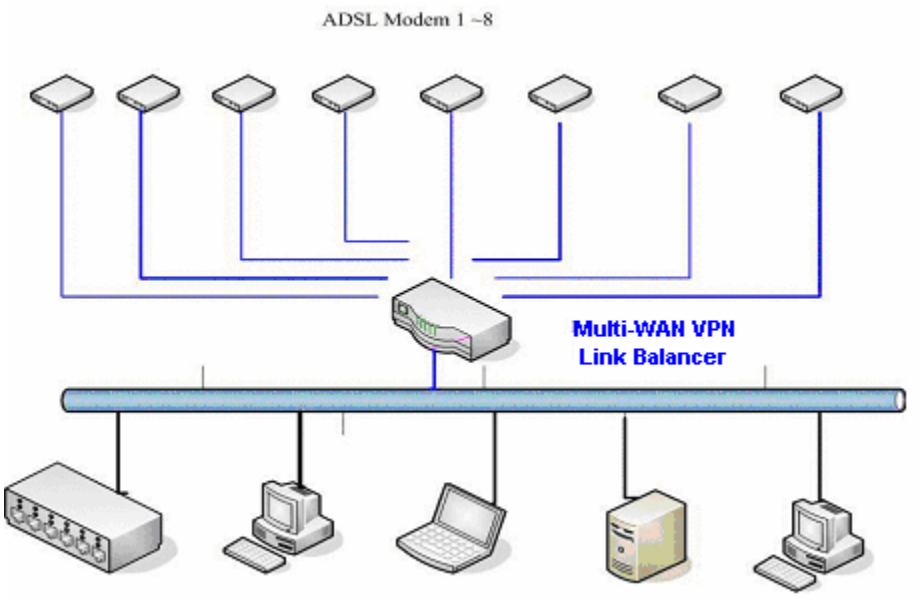

Figure 1-1: Multi-WAN VPN Link Balancer

Internet Features

- ***Flexible use of WAN ports***

  There are 8 WAN ports available for use on Multi-WAN Link Balancer. The user can decide how many WAN ports to use by setting the web page on setup area.

- ***Shared Broadband Internet Access***

  All LAN users can access the Internet through the Multi-WAN VPN Link Balancer by sharing from one (1) up to eight (8) Broadband modems and connections.

- ***High-Performance multi ADSL Modem Support***

  The Multi-WAN VPN Link Balancer has eight (8) WAN ports, allowing the connection of up to eight (8) Broadband modems at the same time.
  This can provide a greater increase in bandwidth than is allowed by a single modem.

This flexible configuration allows each port to use a different type of modem and connection method. Also, the Internet traffic that is shared between the 8 modems can be pre-determined.

- ***Support for all common Connection Methods***

  All popular DSL, Cable Modems and connection methods are supported. These include - Fixed IP, Dynamic IP, PPPoE and PPTP.

- ***Inbound/Outbound Traffic Load Balancing and Failover***

  There are a variety of load balancing methods that allow administrators to manage the traffic from LAN or WAN in order to maximize bandwidth - as well as smart health check methods to protect against connection failure for failover.

- ***PPPoE Session Management***

  Multiple PPPoE sessions are supported and you can choose “mapping” sessions to selected PCs if desired.

- ***Multiple IP Address Support***

  If your ISP allocates you multiple IP addresses, these are also supported and you can “map” IP addresses to selected PCs if desired.

- ***Special Application***

  This feature allows you to use some non-standard applications; for example, where the port number used for the response is different to the port number used by the sender.

- ***Virtual Server***

  This feature allows Internet users to access Internet servers on your LAN. For standard servers such as Web, FTP or E-Mail servers, only the IP address of the server PC is required. You can also define your own Server types if required.

- ***Multiple DMZ***

  A "DMZ" PC will receive incoming connection requests which would otherwise be blocked. For each IP address allocated by your ISP, a separate "DMZ" PC can be specified. So if your ISP has given you multiple IP addresses, you can have multiple “DMZ” PCs. With the Multi-WAN VPN Link Balancer, each “DMZ” PC has unrestricted 2-way Internet access, providing the ability to run programs that are otherwise normally incompatible with NAT routers.

- ***Access Filter***

  The network Administrator can use the Access Filter to gain fine control over the Internet access and applications available to LAN users. Ten (10) user groups are available and each group can be assigned unique access rights.

- ***Block URL***

  This feature can be used by the Administrator to block access to undesirable Web sites by LAN users. You can even assign different settings for different groups of PCs.

- ***Session Limit***

  With the Session Limit feature, if the number of new sessions for the system exceeds the maximum allowance set by the Administrator in the sampling time, any new session in the system will be dropped.

- ***System Filter Exception***

  This feature ensures that every packet with an unrecognized port will be rejected so as to prevent access to port scanning programs from hackers. However, in some situations this may incur

problems with some servers (e.g. SMTP server port 113) or WAN clients which require a response packet to verify the availability of their communication peers.

- ***VPN (Virtual Private Network)***

  Support is provided for up to 50 VPN tunnels with a failover and back-up mechanism.

- ***VPN Mesh Group.***

  The Multi-WAN VPN Link Balancer also supports VPN Load Balance with mesh group configuration.

Other Features

- ***12-Port Switching Hub***

  The Multi-WAN VPN Link Balancer incorporates an 8-port 10 /100BaseT switching hub, making it easy to create or extend your LAN as needed.

- ***DHCP Server Support***

  Dynamic **H**ost **C**onfiguration **P**rotocol provides a dynamic IP address to PCs and other devices upon request. The Multi-WAN VPN Link Balancer can act as a **DHCP Server** for devices on your local LAN.

- ***Multi Segment LAN Support***

  LANs comprising of one or more segments or additional IPs are supported via the Multi-WAN VPN Link Balancer's built-in static routing table.

- ***Easy Setup***

  Setup and configuration is easily accomplished through your favorite WEB browser.

- ***Remote Management***

  The Multi-WAN VPN Link Balancer can be managed from any PC on your LAN. Also, if an Internet connection exists, it can (optionally) be configured via the Internet.

- ***Password - protected Configuration***

  Optional password protection is provided to prevent unauthorized users from modifying the configuration data and settings.

- ***HTTP Firmware Upgrade and backup***

  The web management feature allows you to use HTTP upgrade for new firmware and backup system configuration from a local or even remote site, as long as “Remote upgrade” and “Remote web-based setup” is enabled in the advanced feature web page.

- ***Email Alert***

  The Email Alert will send a warning email message to the system administrator if any of the WAN ports become disconnected when more than two WAN ports are enabled or if there is excessive ping notification.

- ***Syslog***

  This is a very useful feature for monitoring the device in that it can generate real time system information on the web page or on a particular machine.

- ***QoS Configuration.***

  This function will allow higher priority pass-through for specified packets such as real-time applications like Internet phone, video conference, etc.

- ***UPnP***

  When UPnP (Universal Plug & Play), is set to “Enable” - the Multi-WAN VPN Link Balancer becomes a network device. This feature is useful for detecting and controlling network devices such as Internet gateways.

Package Contents

The following items are included in the Multi-WAN VPN Link Balancer package:

- Multi-WAN VPN Link Balancer Unit
- Power Cord
- Quick Installation Guide
- CD-ROM containing the on-line manual.

If any of the above items are damaged or missing, please contact your dealer immediately.

Physical Details

Front Panel

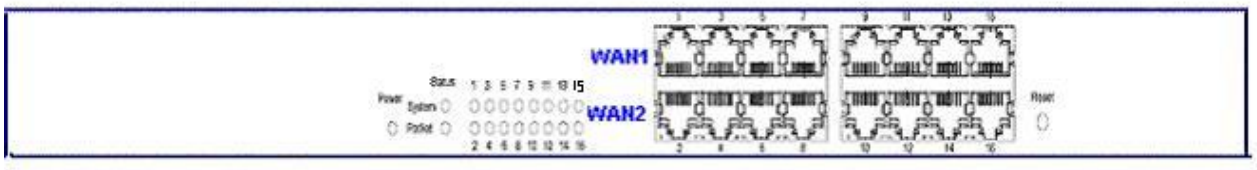

Figure 1-2: Front Panel

Front Panel LED indication is as follows:

Power	OFF – No Power ON – Normal Operation
Status **System** **Packets**	 Blinking – Normal Operation. ON/OFF – Error Blinking – Packets Active ON/OFF – No Packet
Ethernet	Green ON – 100M Linked Yellow ON – 10M Linked Blinking – Data Transmit / Receive. OFF – No Linked

Ethernet Ports and Reset Button

Ethernet Ports	WAN ports: using Port 1 to Port 4 for connecting to Modem(s). LAN ports: The remaining ports which are connected to PCs or a Hub. Note: Any port will automatically operate as an “Uplink” port if required. You can use a normal LAN cable to connect to a normal port on another hub.
Reset Button	When pressed and released, the Multi-WAN VPN Link Balancer will reboot (restart) within 1 second. It will reset to default when pushed and held for more than 3 seconds.

Some Status and Error conditions are indicated by the combinations of LEDs, as shown below:

LED Action	Condition
Status – System & Packets flash alternatively.	Firmware Download in progress.
Status – System & Packets flash concurrently.	MAC address not assigned.
Status – System (Solid Off) & Packets (Solid On)	SDRAM error
Status – System (Solid On) & Packets (Solid On)	Timer/Interrupt error

Rear Panel

Figure 1-3: Rear Panel

AC 100V ~ 240V	Connects to AC100~240V / 50~60Hz with supplied AC power cord.

Default Settings

When the Multi-WAN VPN Link Balancer has finished booting, all configuration settings will be set to the factory defaults, including:

- *IP Address* set to its default value of 192.168.1.1, with a *Network Mask* of 255.255.255.0
- *DHCP Server* is enabled
- *User Name: admin*
- Password cleared (no password)

TFTP Download

This setting should be used only if your Multi-WAN VPN Link Balancer becomes unusable and you are attempting to restore it by upgrading the firmware. Follow this procedure:

1. Power-On the Multi-WAN VPN Link Balancer.
2. Use the supplied Windows utility or a TFTP client program to apply the new firmware. If using the supplied Windows TFTP program, the screen will look like the following example:

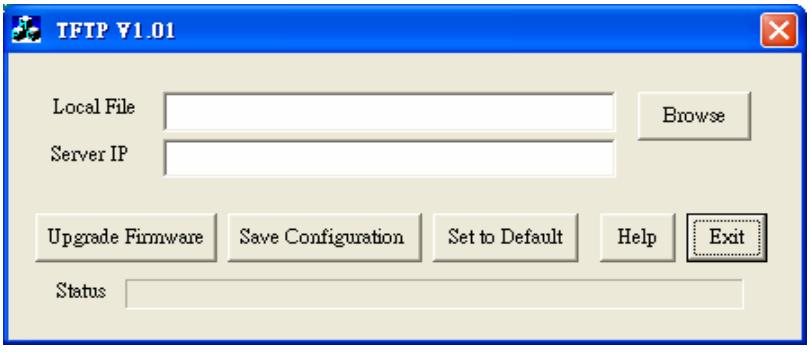

Figure 1-4: Windows TFTP utility

- Enter the name of the firmware upgrade file located on your PC, or click the "Browse" button to locate the file.
- Enter the LAN IP address of the Multi-WAN VPN Link Balancer in the "Server IP" field.
- Click "Upgrade Firmware" to send the file to the Multi-WAN VPN Link Balancer.

3. When the upgrade is finished, the Multi-WAN VPN Link Balancer should work normally. The factory default settings will be applied.

Note:

The supplied Windows TFTP utility also allows you to perform three (3) additional operations:

- Save the current configuration settings to your PC (use the "Save Configuration" button).
- Restore a previously saved configuration file to the Multi-WAN VPN Link Balancer (use the "Upgrade Firmware" button).
- Set the Multi-WAN VPN Link Balancer to its default values (use the "Set to Default" button).

2: Basic Setup

Overview

Basic Setup of your Multi-WAN VPN Link Balancer involves the following steps:

1. Attach the Multi-WAN VPN Link Balancer to a PC using any LAN port (5 to16) and configure it for your LAN.
2. Install your Multi-WAN VPN Link Balancer in your LAN and connect the Broadband Modem(s).
3. Configure your Multi-WAN VPN Link Balancer for Internet Access.
4. Configure PCs on your LAN to use the Multi-WAN VPN Link Balancer.

Requirements

- One (1) up to four (8) DSL or Cable modems, each with an ISP Internet Access account.
- Network cables. Use standard 10/100BaseT network (UTP) cables with RJ45 connectors
- TCP/IP network protocol must be installed on all PCs.

Procedure

1: Configuring the Multi-WAN VPN Link Balancer for your LAN

1. Use a standard LAN cable to connect your PC to any LAN port (9 -16) on the Multi-WAN VPN Link Balancer. (WAN ports from Port 1 ~ 8)
2. Connect the power cord into the power outlet on the rear panel of the Multi-WAN VPN Link Balancer.
3. Power-on your PC. If your PC is already running, restart it. It will then obtain an IP address from the Multi-WAN VPN Link Balancer.
4. Open your WEB browser.
5. In the *Address* or *Location* box enter:

   `HTTP://192.168.1.1`

6. You will be prompted for the User Name and password, as shown below:

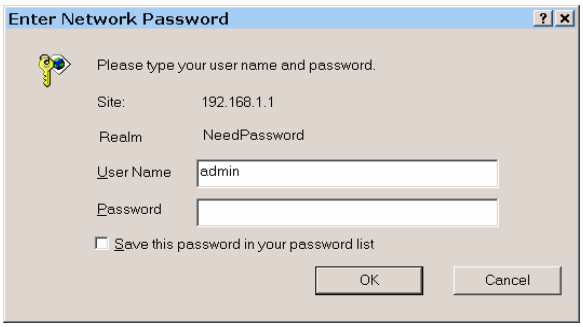

Figure 2-1: Password Dialog

7. Enter *admin* for the "User Name" and leave the "Password" field blank.
   - The "User Name" is always set as *admin*
   - For security, it is highly recommended that you set a password. You may do this using the ***Admin Setup*** screen.
8. After logging in, you will see the ***Administrator Password*** setup in the ***Admin Setup*** screen, as shown below.
   Assign a password by entering it in the "Password" and "Verify Password" Fields.

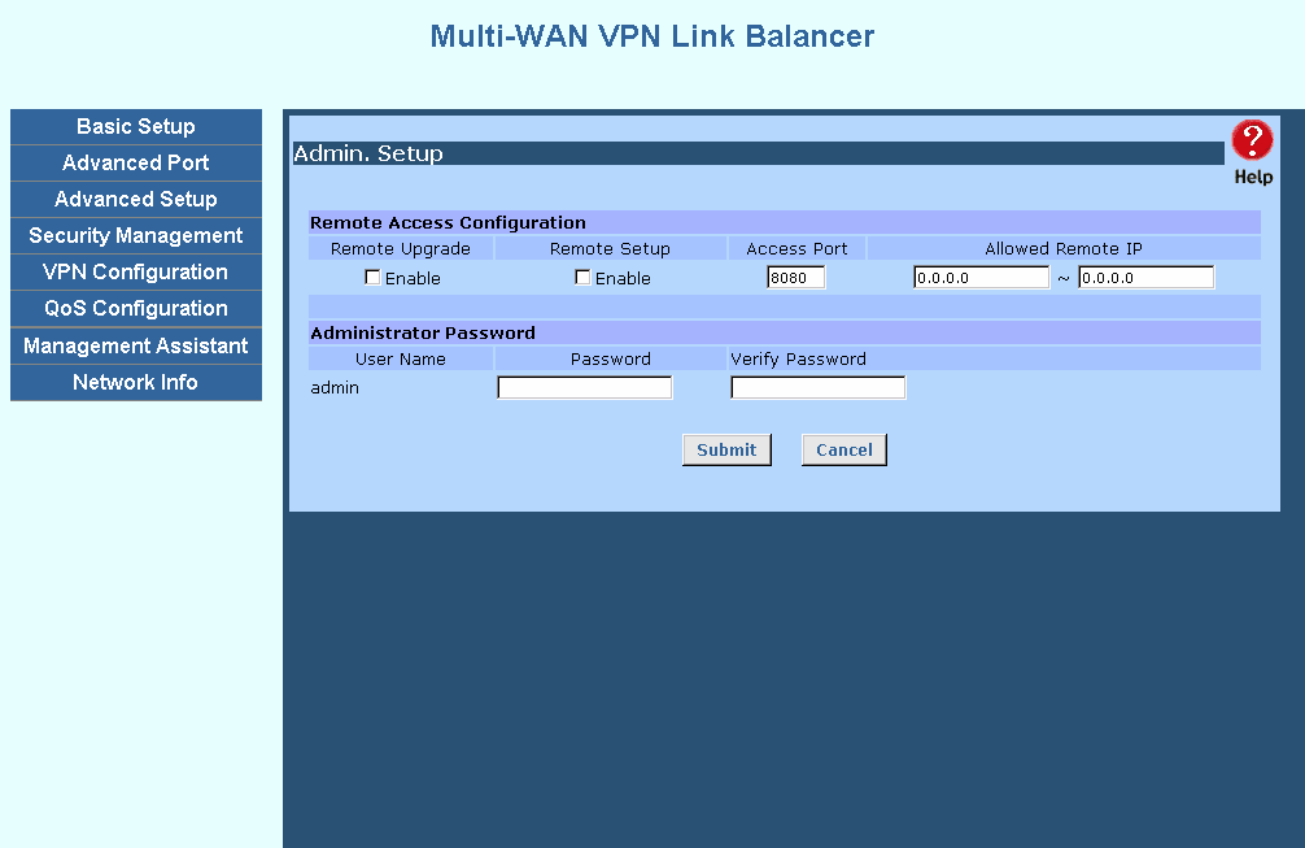

Figure 2-2: Home Screen (Admin. Setup)

9. Select ***LAN & DHCP*** from the menu. You will see a screen like in the example below.

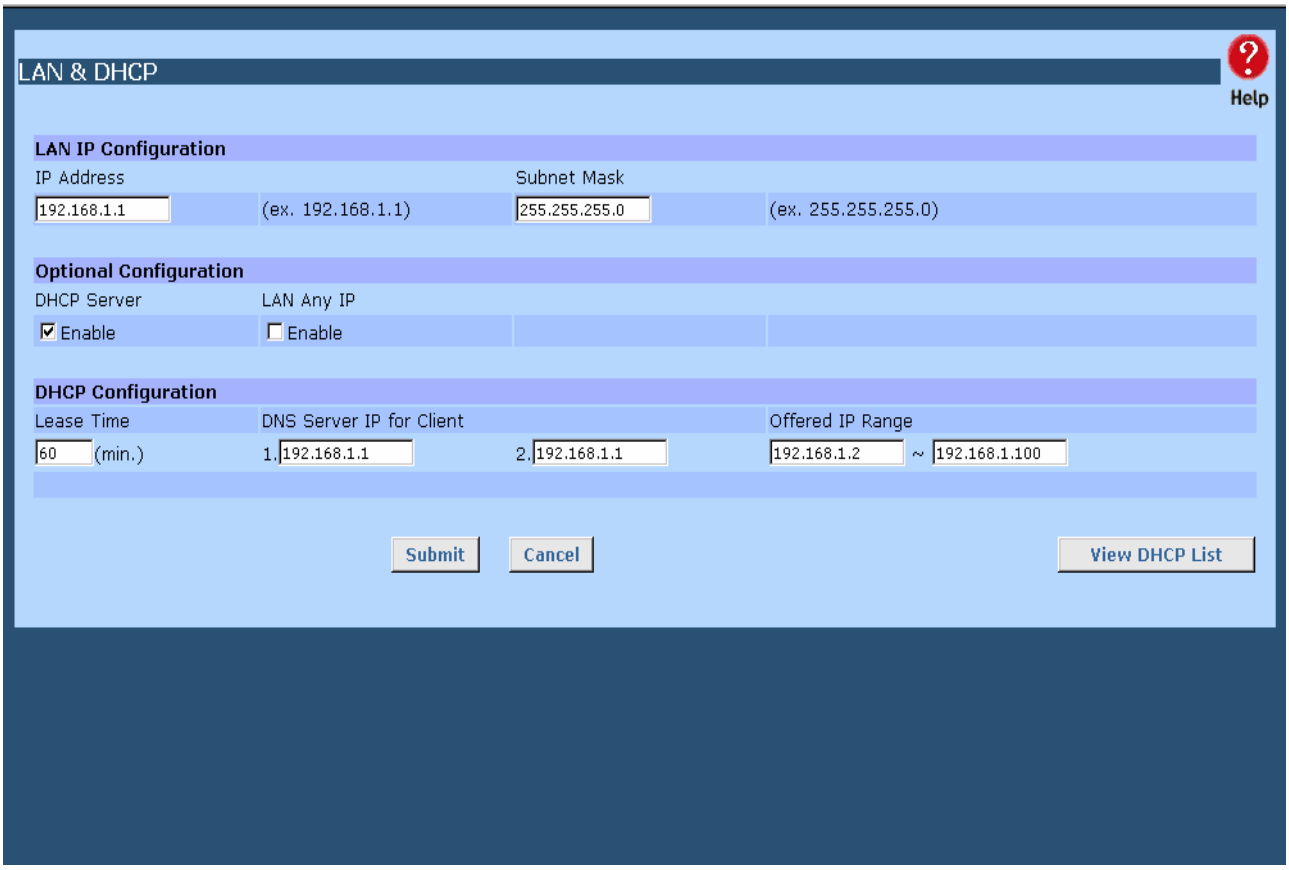

Figure 2-3: LAN & DHCP Setup

10. If your LAN already has a DHCP Server and you wish to continue using it, the following configuration is required:
    - The DHCP Server function in the Multi-WAN VPN Link Balancer must be **disabled**. You will find this setting in the ***LAN & DHCP*** screen.
    - Your DHCP Server must be configured to provide the Multi-WAN VPN Link Balancer's LAN IP Address as the "Default Gateway".
    - Your DHCP Server must provide correct DNS addresses to any connected PCs.

11. Ensure these settings are suitable for your LAN:
    - See the following table for details of each setting. For most situations, the default settings will be suitable.

Settings – LAN & DHCP

LAN IP Configuration	• **IP Address** – IP address for the Multi-WAN VPN Link Balancer, as seen from the Local LAN. Use the default value unless the address is already in use or your LAN is using a different IP Address range. • **Subnet Mask** –The default value 255.255.255.0 is standard for small (class "C") networks. For other networks, use the Subnet Mask for the LAN segment to which the Multi-WAN VPN Link Balancer is attached. (The same value as the PCs on that LAN segment.)
Optional Configuration	• **DHCP Server Setup** – If set to "*Enable*", the Multi-WAN VPN Link Balancer will assign IP Addresses to the PCs (DHCP clients) on your LAN when they start up. The default and recommended value is "**Enable**". (Windows systems, by default, act as DHCP clients. This setting in the Windows Internet Protocol (TCP/IP) Properties is: *Obtain an IP address automatically*.) • **LAN Any IP** – By default this option is disabled. If you enable "LAN Any IP", then no matter what, the static IP address is held on the client (your PC). The client does not need to change the IP address, even though it has a different IP segment than the LAN segment. It can still access the Internet through NAT.
DHCP Configuration	• **Lease Time** – This is a finite period of time for a DHCP server to lease an IP address to a client. • **DNS Server IP for Client –** An IP address of the default DNS server for the client requesting DNS service. • **Offered IP Range** – The fields set the values used by the DHCP server when allocating IP addresses to DHCP clients. This range also determines the number of DHCP clients supported.
View DHCP List	This table shows the IP addresses which have been allocated by the DHCP Server. For each address which has been allocated, the following information is shown: • **Free Entry** – Indicates how many IP addresses the DHCP server can allocate to DHCP clients. • **Name** – The "hostname" of the PC. In some cases, this may not be known. • **MAC Address** – The physical address (network adapter address) of the PC. • **IP Address** – The IP address that is allocated to this PC. • **Type** – Indicates whether the IP address is to be dynamic or static. • **Status** – If *Dynamic*, the IP address was allocated by this DHCP Server. If *Sniffed*, the IP address was detected by examining the LAN rather than allocated by the DHCP Server. In this case, the *Name* is usually not known. • **Time Left** – The time expired since the IP address was leased.

12. Save your data, then go to *Step 2, Installing the Multi-WAN VPN Link Balancer in your LAN*.

2. Installing the Multi-WAN VPN Link Balancer in your LAN

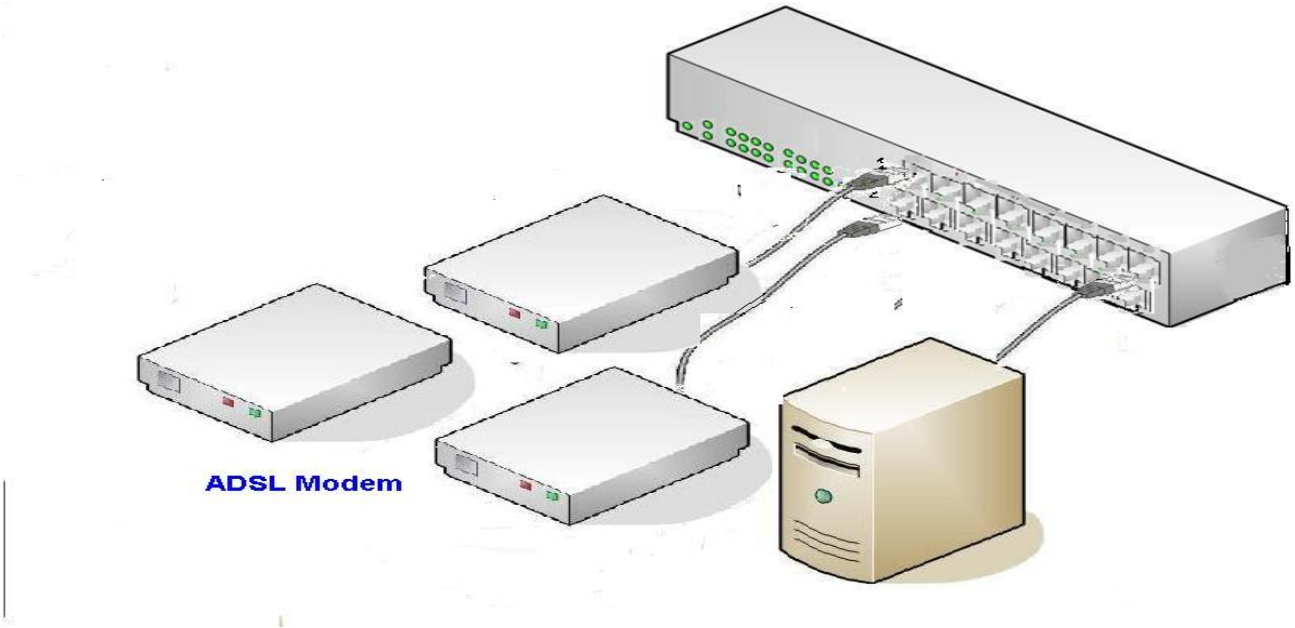

Figure 2-4: Installation Diagram

1. Ensure that the Multi-WAN VPN Link Balancer and any DSL/Cable modem(s) are powered-OFF. Leave the modem or modems connected to their data lines.
2. Connect the Broadband modem(s) to the Multi-WAN VPN Link Balancer.
   - If using only one (1) Broadband modem, connect it to port 1.
   - Use the cable supplied with your DSL/Cable modem. If no cable was supplied, use a standard cable.
3. Use standard LAN cables to connect PCs to the LAN ports on the Multi-WAN VPN Link Balancer.
   - Both 10BaseT and 100BaseT connections can be used simultaneously.
   - If you need to connect the Multi-WAN VPN Link Balancer to another Hub, just use a standard LAN cable to connect any LAN port on the Multi-WAN VPN Link Balancer to a standard port on another hub. Any LAN port on the Multi-WAN VPN Link Balancer will automatically act as an "Uplink" port when required.
   - If devices are connected to the 8 WAN ports (1,2,3 & 4 ~ 8), the remaining ports (9 ~ 16), are LAN ports.
4. Power-Up
   - Power-on the Cable or DSL modem(s).
   - Connect the supplied power cord to the Multi-WAN VPN Link Balancer and power-up.
5. Check the LEDs
   - The ***Power*** LED should be ON.
   - The ***Link/ACT*** LED should be ON if the corresponding WAN port is connected to a broadband modem.

- For each PC connected to the LAN ports, the corresponding ***LAN*** LED (either ***10/Yellow*** or ***100/Green***) should be ON.

3. Configuring the Multi-WAN VPN Link Balancer for Internet Access

To configure access to the Internet, first decide how many WAN ports you are going to use. The pull down menu on the **MAX WAN** web page (Figure 2-5) will let you setup the WAN port numbers. You can choose from two (2), up to eight (8) WAN ports. Once you have selected how many ports you are going to use, click on Submit. You may then proceed to the **Primary Setup** page.

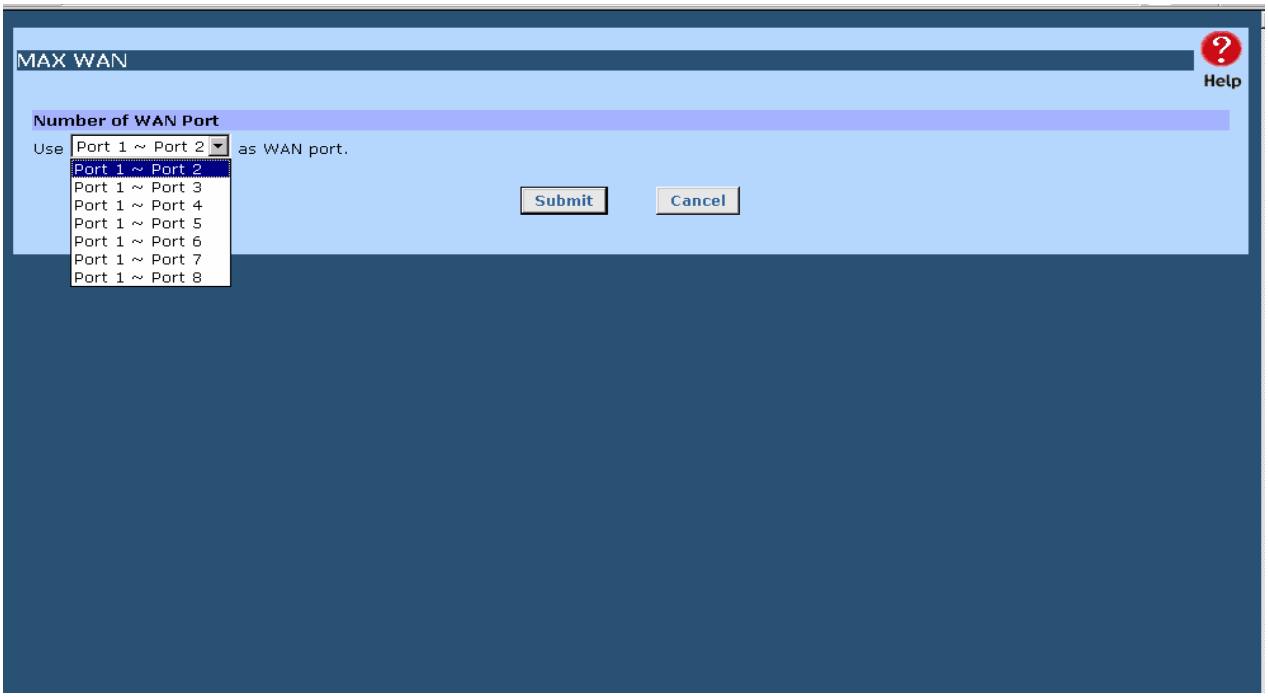

Figure 2-5: MAX WAN

4. Configuring the Multi-WAN VPN Link Balancer for Internet Access

Select ***Primary Setup*** from the menu. You will see a screen like in the example below.

- Configure each WAN one by one through the **Interface** column pull-down menu.
- For any of the following situations, refer to ***Chapter 3: Advanced Port Setup,*** for any further configuration which may be required:
  - Using multiple WAN ports
  - Enabling multiple IP addresses on each WAN port
  - Enabling multiple PPPoE sessions
  - PPTP connection method

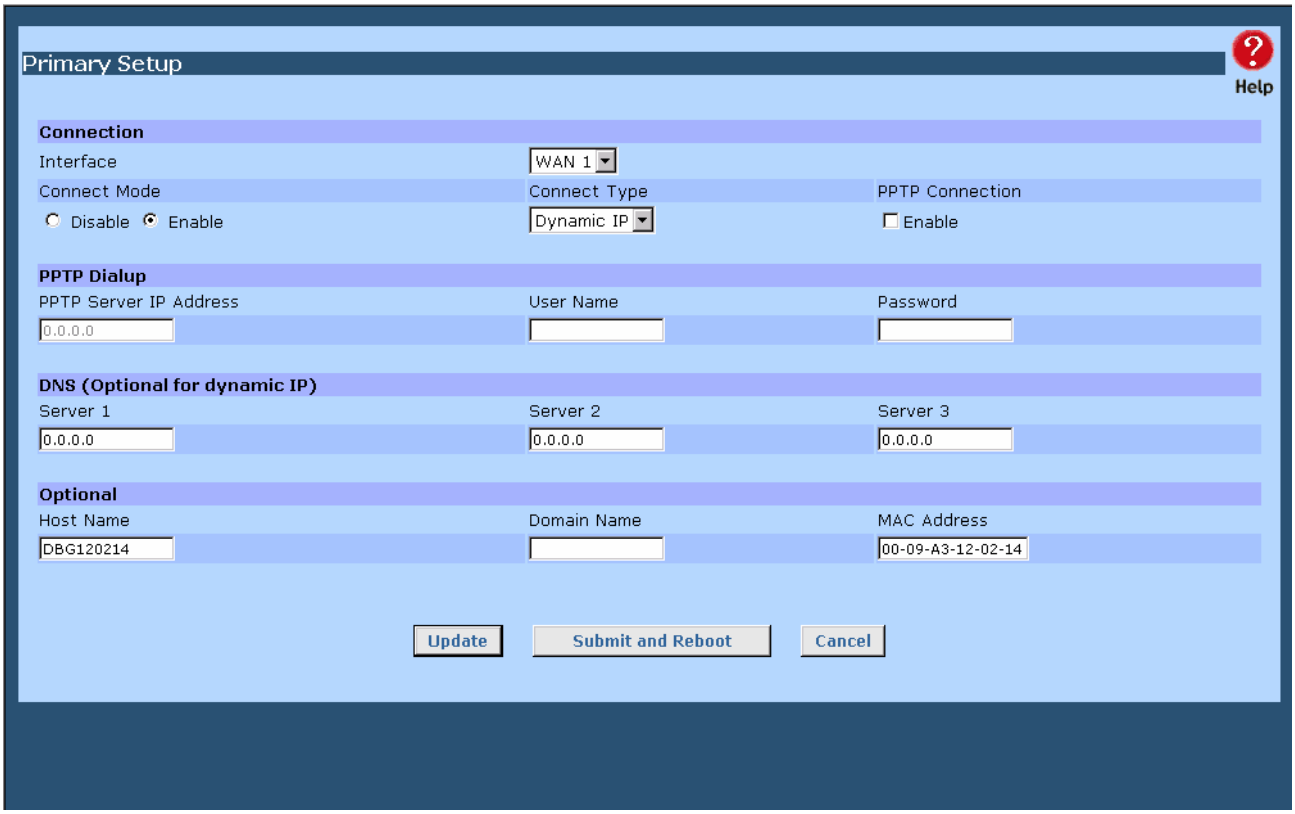

Figure 2-5: Primary Setup

Settings – Primary Setup

Connection Mode	• **Interface** – A pull down menu for each WAN port that you are going to connect to the Internet. • **Connect Mode** – **Enable** – Select this if you have connected a broadband modem to this port. **Disable** – Select this if there is no broadband modem connected to this port.
Connection Type	Check the data supplied by your ISP and select the appropriate option. • **Static IP** – Select this if your ISP has provided a Fixed or Static IP address. Enter the data into the *Address Info* fields. • **Dynamic IP** – Select this if your ISP provides an IP address automatically when you connect. You can ignore the *Address Info* fields. • **PPPoE** – Select this if your ISP uses this method. (Usually, your ISP will provide some PPPoE software; however, this software is not required and should not be used.) If this method is selected, you must complete the *PPPoE dialup* fields. **Note:** If using the PPTP connection method (enable **PPTP Connection**), select *Static IP* or *Dynamic IP* as appropriate, according to the IP Address method used by your ISP.

Address Information	This is for *Static IP* users only. Enter the address information (IP Address, Subnet Mask, Gateway) provided by your ISP. If your ISP provides multiple IP address, you can use the ***Multi-DMZ*** screen to assign any additional IP addresses.
PPPoE / PPTP Dialup	This is for ***PPPoE*** or ***PPTP*** users only. • Enter the ***Username*** and ***Password*** provided by your ISP. • If using PPTP, enable the ***PPTP Connection*** checkbox and enter the IP address of the PPTP server. • **PPPoE Host name** (Optional) – This field is used by a Host to uniquely associate an access concentrator with a particular Host request. **Note:** There are additional PPPoE/PPTP options on the ***Port Options*** screen. To use multiple PPPoE sessions on either port, configure settings in the ***Advanced PPPoE*** screen.
DNS	If using a *Fixed IP* address, you MUST enter at least 1 DNS address. If using a *Dynamic IP*, *PPPoE or PPTP*; DNS information is optional.
Optional	• **Host name** – This is required by some ISPs. If your ISP provided a Host Name, enter it here. Otherwise, you can use the default value. • **Domain name** – This is required by some ISPs. If your ISP provided a Domain Name, enter it here. Otherwise, you can use the default value. • **MAC address** – Some ISP records your MAC address (also called "Physical address" or "Network Adapter address"). If so, you can enter the MAC address expected by your ISP in this field. Otherwise, this should be left at the default value.

Setup of the Multi-WAN VPN Link Balancer is now complete. PCs on your LAN must now be configured. See the following section for details.

4: Configure PCs on your LAN

Overview

For each PC, the following settings may need to be configured:

- TCP/IP network settings
- Internet Access configuration

TCP/IP Settings

If using the default Multi-WAN VPN Link Balancer settings and the default Windows 95/98/ME/2000/XP TCP/IP settings, no changes need to be made. Just start (or restart) your PC.

- By default, the Multi-WAN VPN Link Balancer will act as a DHCP Server, automatically providing a suitable IP Address (and related information) to each PC when the PC boots.
- For all non-Server versions of Windows, the default TCP/IP setting is to act as a DHCP client. In Windows, this setting is: *Obtain an IP address automatically*.
  Just start (or restart) your PC and it will automatically obtain an IP address from the Multi-WAN VPN Link Balancer.
- If using fixed IP addresses on your LAN, or if you wish to check your TCP/IP settings, refer to ***Appendix B – Windows TCP/IP Setup***.

Internet Access

To configure your PCs to use the Multi-WAN VPN Link Balancer for Internet access, follow this procedure:

For Windows 9x/2000

1. Select *Start Menu - Settings - Control Panel - Internet Options*.
2. Select the *Connection* tab and then click the *Setup* button.
3. Select "I want to set up my Internet connection manually", or "I want to connect through a local area network (LAN)" and click *Next*.
4. Select "I connect through a local area network (LAN)" and click "*Next*".
5. Ensure that all of the boxes on the following *Local area network Internet Configuration* screen are **unchecked**.
6. Check the "No" option when prompted "Do you want to set up an Internet mail account now?"
7. Click *Finish* to close the Internet Connection Wizard.
   Setup is now completed.

For Windows XP

1. Select *Start Menu - Control Panel - Network Connections.*
2. Select *Create a new connection*.
3. Click *Next* on the "New Connection Wizard" screen.
4. Select "*Connect to the Internet*" and click "*Next*".
5. Select "*Set up my connection manually*" and click "*Next*".

6. Check "**Connect using a broadband connection that is always on**" and click *Next*.
7. Click *Finish* to close the *New Connection Wizard.*
   Setup is now completed.

Accessing AOL

To access AOL (America On Line) through the Multi-WAN VPN Link Balancer, the *AOL for Windows* software must be configured to use TCP/IP network access rather than a dial-up connection. The configuration process is as follows:

- Start the *AOL for Windows* communication software. Ensure that it is Version 2.5, 3.0 or later. This procedure will not work with earlier versions.
- Click the *Setup* button.
- Select *Create Location* and change the location name from "New Locality" to " Multi-WAN VPN Link Balancer".
- Click *Edit Location*. Select *TCP/IP* for the *Network* field. (Leave the *Phone Number* field blank.)
- Click *Save*, then *OK*.
  Configuration is now complete.
- Before clicking "Sign On", always ensure that you are using the "Multi-WAN VPN Link Balancer" location.

Macintosh Clients

For Macintosh users, the procedure for accessing the Internet via the Multi-WAN VPN Link Balancer is as follows.

1. Open the TCP/IP Control Panel.
2. Select *Ethernet* from the *Connect via* pop-up menu.
3. Select *Using DHCP Server* from the *Configure* pop-up menu. The DHCP Client ID field can be left blank.
4. Close the TCP/IP panel, saving your settings.

Note:

If using manually assigned IP addresses instead of DHCP, the required changes are:

- Set the *Router Address* field to the Multi-WAN VPN Link Balancer's IP Address.
- Ensure your *DNS* settings are correct.

Linux Clients

To access the Internet via the Multi-WAN VPN Link Balancer using Linux, it is only necessary to set the Multi-WAN VPN Link Balancer as the "Gateway" and ensure your *Name Server* settings are correct.

Ensure you are logged in as "root" before attempting any changes.

Fixed IP Address

By default, most Unix installations use a fixed IP Address. If you wish to continue using a fixed IP Address, make the following changes to your configuration.

- Set your *Default Gateway* to the IP Address of the Multi-WAN VPN Link Balancer.
- Ensure your *DNS* (Name server) settings are correct.

To act as a DHCP Client (recommended)

The procedure below may vary depending on your version of Linux and X -windows shell.

1. Start your X Windows client.
2. Select *Control Panel - Network*
3. Select the "Interface" entry for your Network card. Normally this will be called "eth0".
4. Click the *Edit* button, set the "protocol" to "DHCP" and save this data.
5. To apply your changes, use the "Deactivate" and "Activate" buttons if available. Otherwise, restart your system.

3: Advanced Port

Overview

- ***Port Options*** contains some options which can be set on any WAN port. For most situations, the default values are satisfactory.
- ***Load Balance*** is only functional if you are using multiple WAN ports. It allows you to determine the proportion of WAN traffic sent through each port.
- ***Advanced PPPoE*** setup is required if you wish to use multiple sessions on each WAN port. It can also be used to manually connect or disconnect a PPPoE session. Otherwise, this screen can be ignored.
- ***Advanced PPTP*** setup is required if using the PPTP connection method.

Port Options

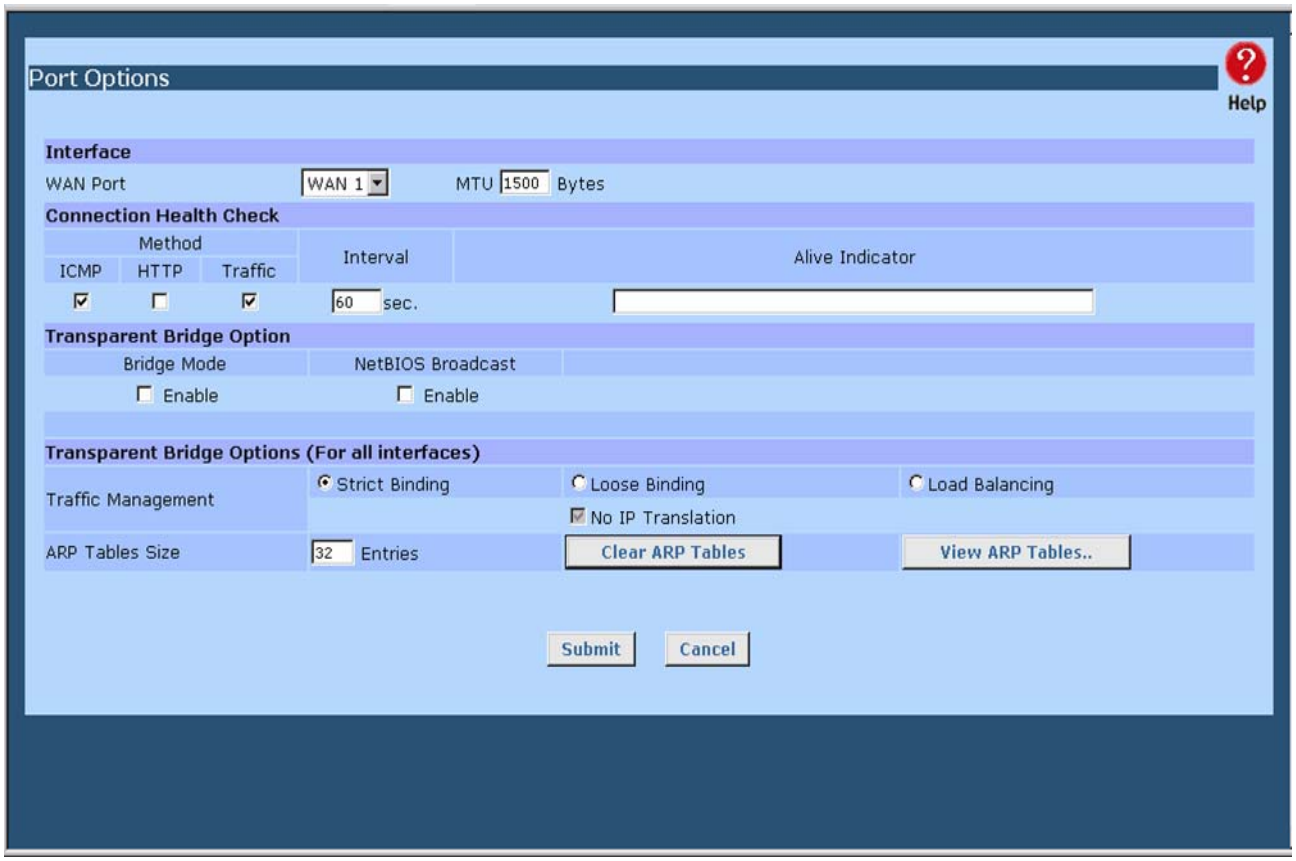

Figure 3-1: Port Options

Settings – Port Options

Interface	• **WAN Port** – Select a particular WAN port from the pull-down menu to setup WAN port configuration. • **MTU** – The Maximum Transmission Unit for the Ethernet data. This is used to determine the packet size to be used on the WAN interface. Normally, this does not need to be changed but if your ISP advises you to use a particular MTU, enter it here. The default MTU value is 1500 Bytes.
Connection Health Check	• **Method** – There are three methods available for checking if a WAN port is alive or not**.** Multiple choices can be selected when using it. • *Disable* will not perform an Alive Indicator Check. By default, Health Check is set to *Enable*. If the "Alive Indicator" input box is left blank, Health Check performs an ICMP echo packet request to the specific destination. This could be either a URL or an IP Address specified by users in the "Alive Indicator" input box or WAN interface gateway. • **Interval** – The interval time for device health check. The default interval time is 60 seconds. • **Alive Indicator** – This is the IP address used to check if the WAN connection is operating. The Multi-WAN VPN Link Balancer will contact this system to check if the WAN connection is working or not. You may change this address if you wish. Default is the gateway IP. **Note**: This is not used for PPPoE connections.
Transparent Bridge Option	• **Bridge Mode** – If set to *Enable*, this WAN port doesn't use NAT & Load Balance function when the LAN/WAN IP have the real IP addresses on the same network segment. • **NetBIOS Broadcast** – If you enable the NetBIOS Broadcast, this will allow you to access files through the Microsoft network neighborhood.
Transparent Bridge Options (For all interfaces)	• **Traffic Management** – **Strict Binding:** Traffic from bridge hosts (eg. transparent to WAN1) can only go through the specified WAN interface (eg. WAN1). **Loose Binding:** This acts as a failover mechanism for transparent bridge mode. Traffic from bridge hosts (eg. transparent to WAN1) can go through any WAN interface (eg. WAN2 or other) when bind interface (eg. WAN1) is down. **Load Balancing:** This acts as a load balancing mechanism for transparent bridge mode. Traffic from bridge hosts (eg. transparent to WAN1) can go through any WAN interface (eg. WAN1, 2 or other) based on the loading mechanism specified in the load balance section. • **ARP Table** – The ARP Table is used by the device to determine the bridge hosts' location (e.g. inside/outside WAN and which WAN). Its size can be adjusted if needed. **View ARP Tables** displays ON/OFF selection of bridge mode on each WAN port. **Clear ARP Tables** disables bridge mode on all WAN ports.

Load Balance

This screen is only operational if using Internet connections on multiple WAN ports

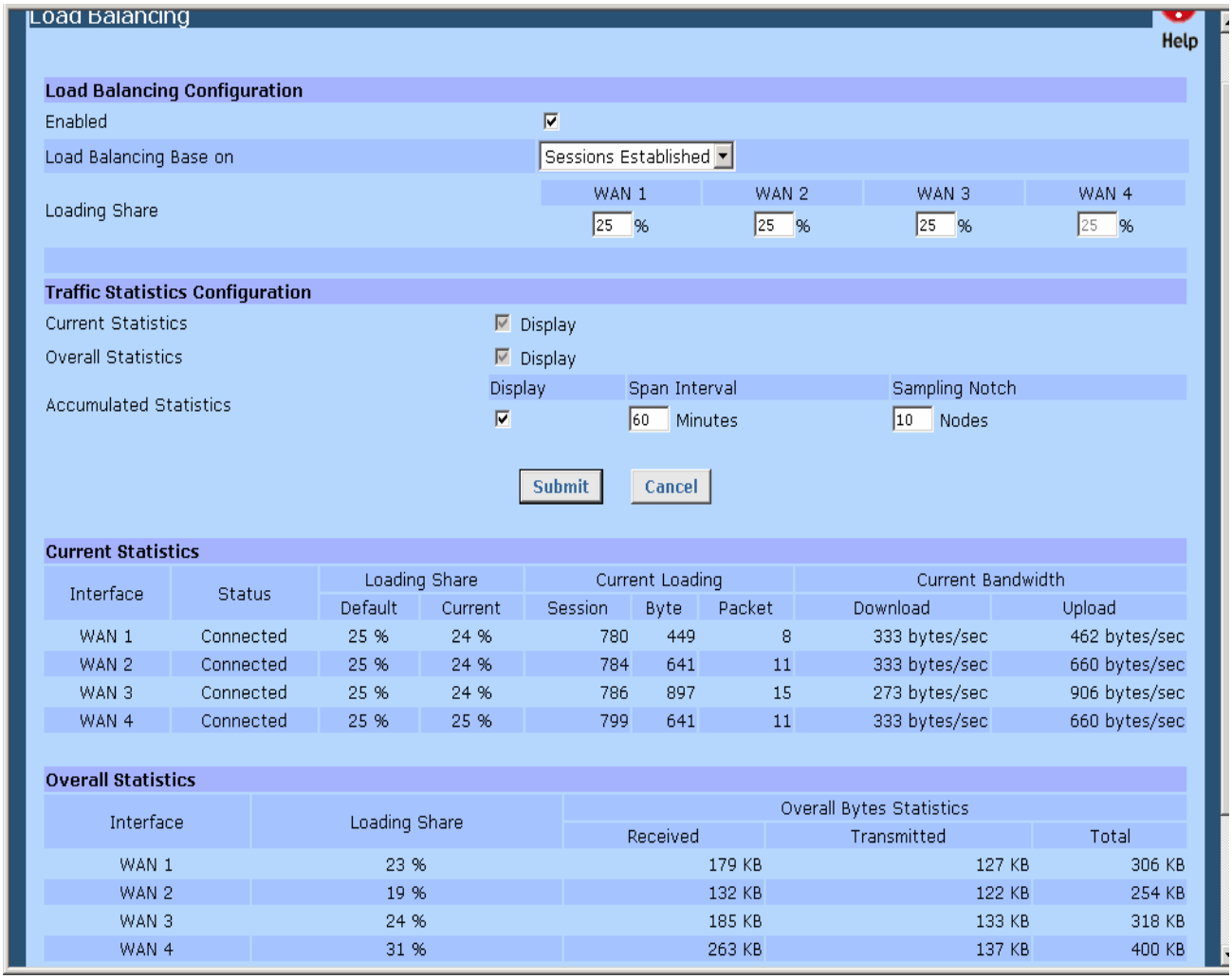

Figure 3-2: Load Balance

Only functional when using two (2) or more WAN ports - these settings determine the proportion of traffic sent over each port.

Settings – Load Balance

Load Balance Configuration	• **Enable** – This enables your Load Balance setting options and must be checked for other settings on this screen to be effective.
	• **Balance Type** – You can select the Balance types based on:
	  • Bytes Tx + Rx – Traffic is measured by Bytes. (Least load)
	  • Packets Tx + Rx – Traffic is measured by Packets. (Least load)
	  • Sessions established – Traffic is measured by Sessions. (Least load)
	  • IP Address – Traffic is measured by IP address. (Least load)
	  • Auto Learning – The largest unused upload/outgoing bandwidth.
	  • Fastest – The largest upload bandwidth.
	  • Priority – The highest priority**.**
	  • Round Robin – Continuously repeating sequence.
	  • Weight Round Robin – In sequence with weight placed accordingly.
	• **Loading Share** – Enter the percentage (%) of traffic to be sent over each WAN port. If one WAN port connection has a greater bandwidth than another, the one with the greater bandwidth is given a higher percentage of traffic than the other.
	Click the "submit" button to save your changes.

Traffic Statistics Configuration	• **Current Statistics** – Enable current packets loading share statistics for WAN1 & WAN2. • **Overall Statistics** – Enable overall packets loading share statistics for WAN1 & WAN2. • **Accumulated Statistics** – Enable Accumulated statistics for WAN1 & WAN2 for a define time interval.
Current Statistics	Current loading share table for WAN! & WAN2
Overall statistics	Overall loading share table for WAN1 & WAN2

Advanced PPPoE

The Advanced PPPoE screen is required in order to use multiple PPPoE sessions on the same WAN port.

It can also be used to manually connect or disconnect a PPPoE session.

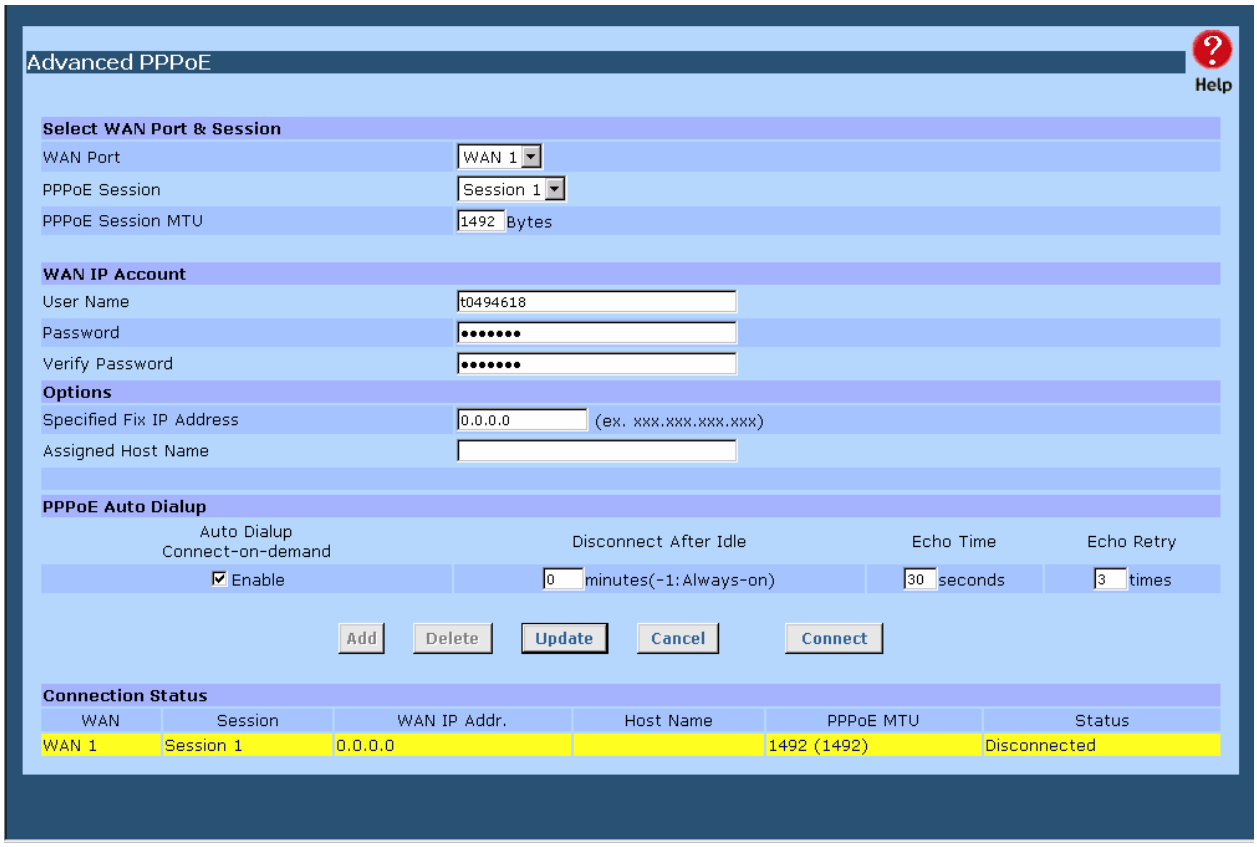

Figure 3-3: Advanced PPPoE

Settings – Advanced PPPoE

Select WAN Port & Session	**WAN Port** – Selected WAN port only using PPPoE connection **PPPoE Session** – ISPs can usually provide multiple floating real IPs for PPPoE. Each WAN port can have up to eight (8) PPPoE sessions, each with a different IP address if your WAN port is using PPPoE connectivity. **PPPoE Session MTU** – The Maximum Transfer Unit for PPPoE packet data. Leave it as default unless the ISP provides a different PPPoE packet data size. The default MTU value is 1492 bytes.
WAN IP Account	• **User Name** – Enter the PPPoE user name assigned by your ISP. • **Password** – Enter the PPPoE password assigned by your ISP. • **Verify Password** – Re-enter the PPPoE password assigned by your ISP.

Options	• **Specified Fix IP Address** – If you have a fixed IP address, enter if here. Otherwise, this field should be left at 0.0.0.0. • **Assigned Host Name** –This field is used by a Host to uniquely associate an access concentrator with a particular Host request.
PPPoE Auto Dialup	• **Auto Dialup** (connect-on-demand) – If set to *Enable,* a connection will be established whenever outgoing WAN traffic is detected. If not enabled, you must establish a connection manually. • **Disconnect after Idle** – This determines when an idle connection will be terminated. Enter the required time period. (-1**:** Always on) • **Echo Time** – This determines how often an Echo request is sent to the PPPoE server. The Echo request is used to determine if the connection is still alive. Normally, there is no need to change the default value. • **Echo Retry** – The number of times the Echo request will be sent, if there is no response to the first request. Normally, there is no need to change the default value.
Connection Status	This displays the current connection status for each session.

Advanced PPTP

This Advanced PPTP screen is only useful if using the PPTP connection method.

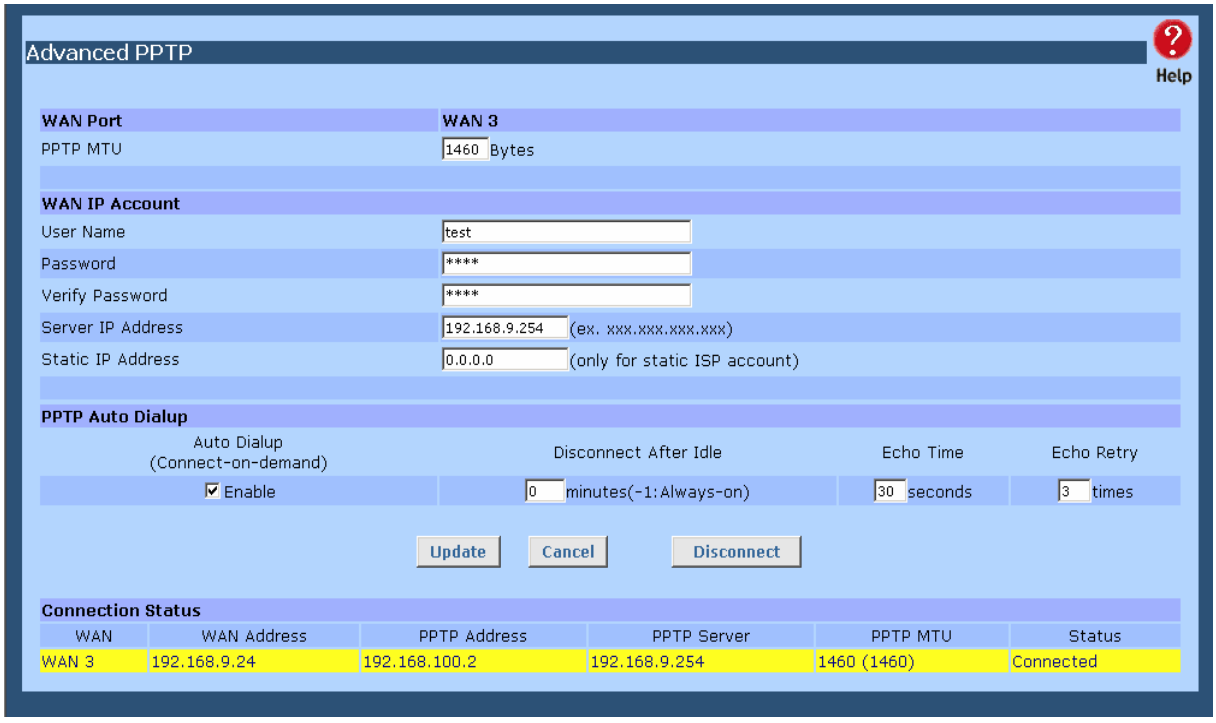

Figure 3-4: Advanced PPTP

Settings – Advanced PPTP

WAN Port	Select the desired WAN port (click desired WAN on Connection Status). The data of the selected port will then be displayed in the *WAN IP Account* section. **PPTP MTU** – Maximum transfer unit for PPTP. The default value is 1460
WAN IP Account	• **User Name** – The PPTP user name (login name) assigned by your ISP. • **Password** – The PPTP password associated with the *User Name* above. This is assigned by your ISP, and used to login to the PPTP Server. • **Verify Password** – Re-enter the PPTP password assigned by your ISP. • **Server IP Address** – Enter the IP address of the PPTP Server, as provided by your ISP. • **Static IP Address** – If you have a fixed IP address, enter if here. Otherwise, this field should be left at 0.0.0.0.
PPTP Auto Dialup	• **Auto Dialup** (connect-on-demand**)** – If set to *Enable,* a connection will be established whenever outgoing WAN traffic is detected. If not enabled, you must establish a connection manually. • **Disconnect after Idle** – This determines when an idle connection will be terminated. Enter the required time period. (-1**:** Always on) • **Echo Time** – This determines how often an Echo request is sent to the PPTP server. The Echo request is used to determine if the connection is still alive. Normally, there is no need to change the default value. • **Echo Retry** – The number of times the Echo request will be sent, if there is no response to the first request. Normally, there is no need to change the default value.
Connection Status	This displays the current PPTP connection status.

4: Advanced Setup

Overview

The following features are provided in Advanced Setup:

- Host IP
- Routing
- Virtual Server
- Special Application
- Dynamic DNS
- Multi DMZ
- UPnP Setup
- NAT Setup
- Advanced Feature

This chapter contains details on the configuration and use of each of these features.

Host IP

This feature is used in the following situations:

- You have Multi-Session PPPoE and wish to bind each session to a particular PC on your LAN.
- You wish to use the ***Access Filter*** feature. This requires that each PC is identified by using the ***Host IP*** screen.
- You wish to have different ***Block URL*** settings for different PCs. This requires that each PC is identified by using the ***Host IP*** screen. (You do not have to use the Host IP feature to apply the same ***Block URL*** settings to all PCs.)
- You wish to reserve a particular (LAN) IP address for a particular PC on your LAN. This allows the PC to use DHCP (In Windows this setting is configured as: "*Obtain an IP address automatically*") while gaining the benefits of a fixed IP address. The PC's IP address will never change, allowing it to be provided to other users and applications.

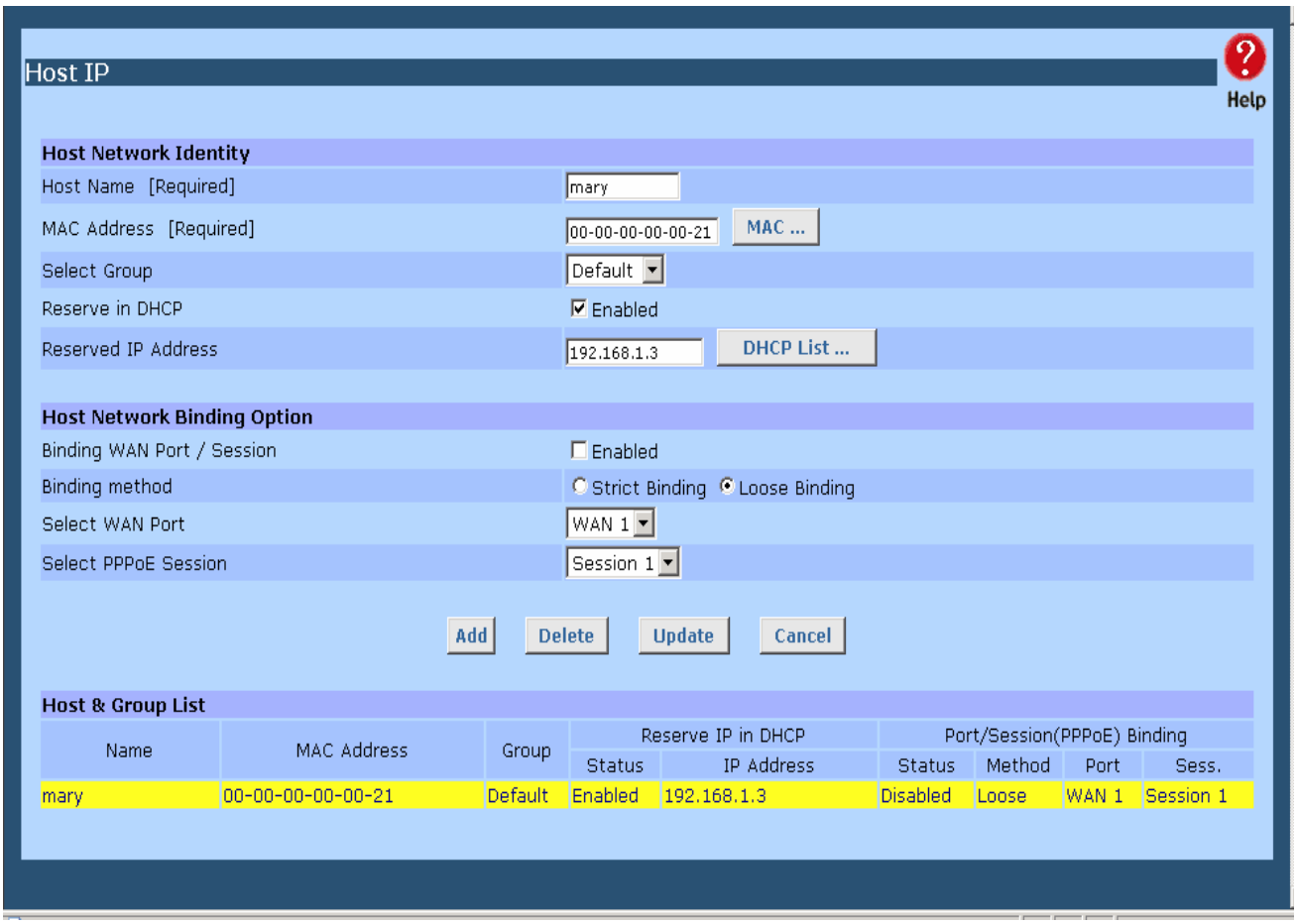

Figure 4-1: Host IP

Settings – Host IP

Host Network Identity	This section identifies each Host (PC) • **Host name** – Enter a suitable name. Generally, you should use the "Hostname" (computer name) as defined on the Host itself. • **MAC Address** – Also called *Physical Address* or *Network Adapter Address*. Enter the MAC address of this Host. • **Select Group** – Select the group you wish this Host to be included in. (Group 1 ~ Group 7). Default is no group. • **Reserve in DHCP** – Select *Enable* to reserve a particular (LAN) IP address for a particular PC on your LAN. This allows the PC to use DHCP (In Windows this setting is configured as: "Obtain an IP address automatically") while retaining an IP address that never changes. • **Reserved IP Address** – Enter the IP address you wish to reserve, if the setting above (Reserve in DHCP) is set to *Enable*. Otherwise, ignore this field.

Host Network Binding	• **Binding WAN Port / Session** – Select *Enable* if you wish to associate this PC with a particular PPPoE session. All traffic for that PC will then use the selected PPPoE port and session. • **Binding Method** – Suppose your PC is bound to WAN1 port and you select "Strict Binding." If WAN1 port is disconnected, your packets cannot go through another WAN port, if it is still alive. If you select "Loose Binding" then if WAN1 port becomes disconnected, your packets will automatically go to another WAN port, if it is alive. • **Select WAN Port / Select PPPoE session** – If the Binding Method setting above is set to *Enable*, select the desired Port and Session. Otherwise, ignore these settings. **Note**: Multiple PPPoE sessions are defined on the ***Advanced PPPoE*** screen.
Buttons	• **Add** – Use this to add a new entry to the database, using the data shown on screen. • **Delete** – Click this to delete the selected entry. • **Update** – After making the desired changes, use this to update the selected entry • **Reset** – Reverse any changes you have made since loading the data from the Multi-WAN VPN Link Balancer.
Host & Group List	This table shows the current bindings.

ARP Status

ARP (Address Resolution Protocol) – This is web page is regarding LAN & WAN ARP statistics and information,

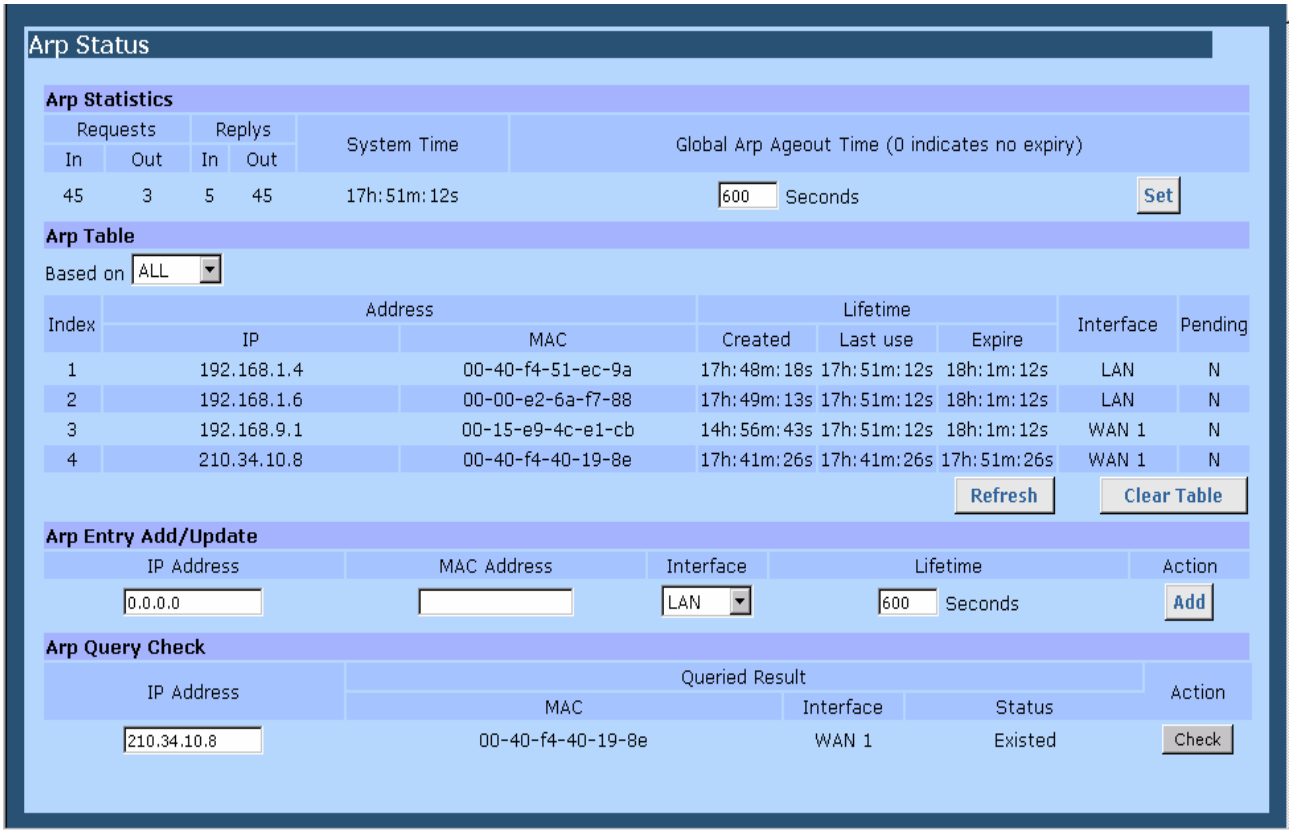

Figure 4-1 (A): ARP Table

Arp Statistics	• **Requests (In / Out)** – The numbers of system ARP sent to requests. • **Reply (In / Out)** –The numbers of system ARP reply to. • **System Time** – System starting time. • **Global Arp Ageout Time** – Arp time out. By default is 600 seconds. If set to “0” means no expire.
Arp Table	• List all LAN, WAN address resolution and its related info.
Arp Entry Add / Update	• According to IP and MAC address, add or update a record to a ARP table
Arp Query Check	• Input LAN or WAN IP address to query ARP.

Routing

This section is only relevant if your LAN has other Routers or Gateways.

- If you don't have other Routers or Gateways on your LAN, you can ignore the ***Static Routing*** page completely.
- If your LAN has other Gateways and Routers, you must configure the Static Routing screen as described below. You also need to configure the other Routers.

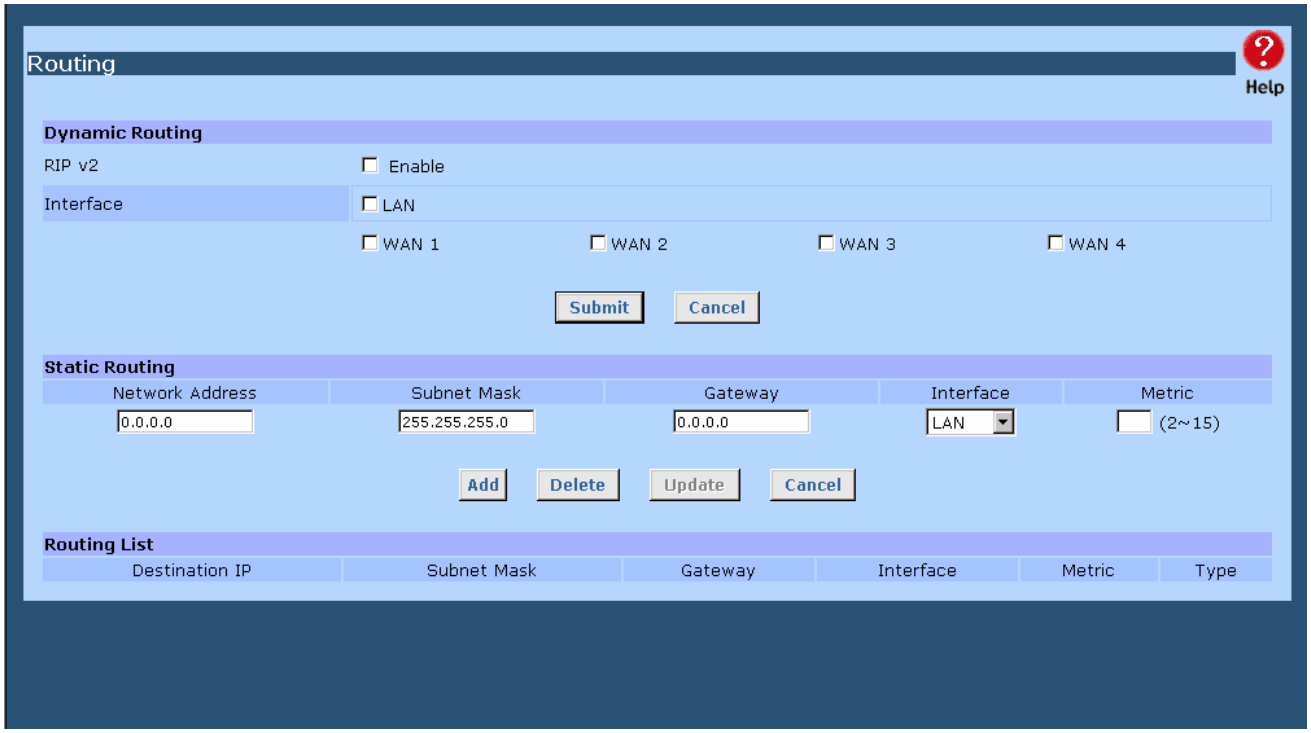

Figure 4-2: Routing

Note:

If there is an entry or entries in the Routing table with an Index of zero (0), these are System entries. You cannot modify or delete these entries.

Settings – Routing

Dynamic Routing	• **RIP v2** – This acts as a "master" switch. If enabled, the selected WAN or LAN will run RIPv1/v2, otherwise RIP function will not be available. • **Interface** – If LAN or other WAN are enabled, the specified WAN or LAN can execute RIP function.

Static Routing	• **Network Address** – The network address of the remote LAN segment. For standard class "C" LANs, the network address is the first 3 fields of the Destination IP Address. The 4th (last) field can be left at 0. • **Netmask** –The Network Mask for the remote LAN segment. For class "C" networks, the default mask is 255.255.255.0 • **Gateway** – The IP Address of the Gateway or Router that the Multi-WAN VPN Link Balancer must use to communicate with the destination IP address entered above. (NOT the router attached to the remote segment.) • **Interface** – Select the correct interface - usually "LAN". The "WAN" interface is only available if NAT (Network Address Translation) is disabled. • **Metric** – The number of "hops" (routers) to pass through to reach the remote LAN segment. The shortest path will be used.
Routing List	This shows the current routing table set by the user.

Configuring Other Routers on your LAN

All traffic for devices not on the local LAN must be forwarded to the Multi-WAN VPN Link Balancer so that it can be forwarded to the Internet. This is done by configuring other Routers to use the Multi-WAN VPN Link Balancer as the *Default Route* or *Default Gateway*, as illustrated by the example below.

Static Routing - Example

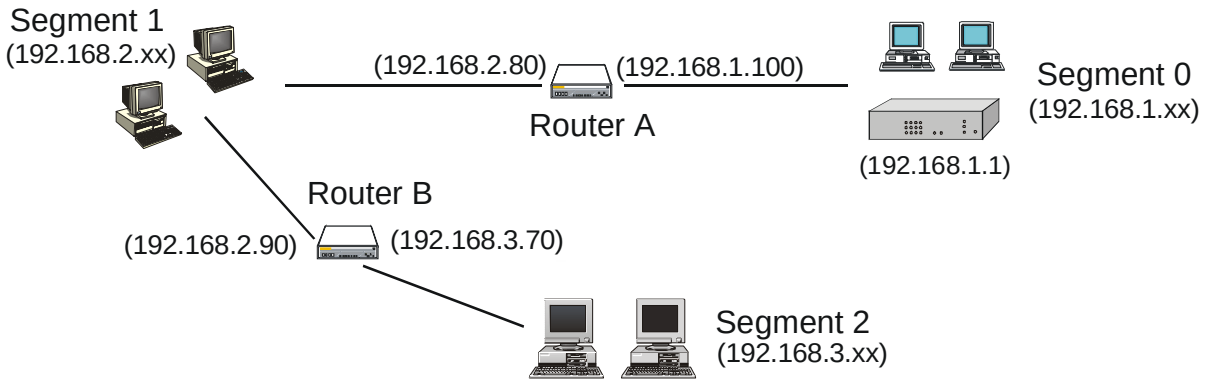

Figure 4-3: Routing Example

For the Multi-WAN VPN Link Balancer Gateway's Routing Table

For the LAN shown above, with 2 routers and 3 LAN segments - the Multi-WAN VPN Link Balancer requires 2 entries as follows:

Entry 1 (Segment 1)	
Destination IP Address	192.168.2.0
Network Mask	255.255.255.0
Gateway IP Address	192.168.1.100
Interface	LAN
Metric	2
Entry 2 (Segment 2)	
Destination IP Address	192.168.3.0
Network Mask	255.255.255.0 (Standard Class C)
Gateway IP Address	192.168.1.100
Interface	LAN
Metric	3

For Router A's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.1.1
Metric	2

For Router B's Default Route

Destination IP Address	0.0.0.0
Network Mask	0.0.0.0
Gateway IP Address	192.168.2.80
Interface	LAN
Metric	3

Virtual Server

This feature allows you to make Servers on your LAN accessible to Internet users. Normally, Internet users would not be able to access a server on your LAN because:

- Your Server's IP address is only valid on your LAN, not on the Internet.
- Attempts to connect to devices on your LAN are blocked by the firewall in the Multi-WAN VPN Link Balancer.

The "Virtual Server" feature solves these problems and allows Internet users to connect to your servers, as illustrated below.

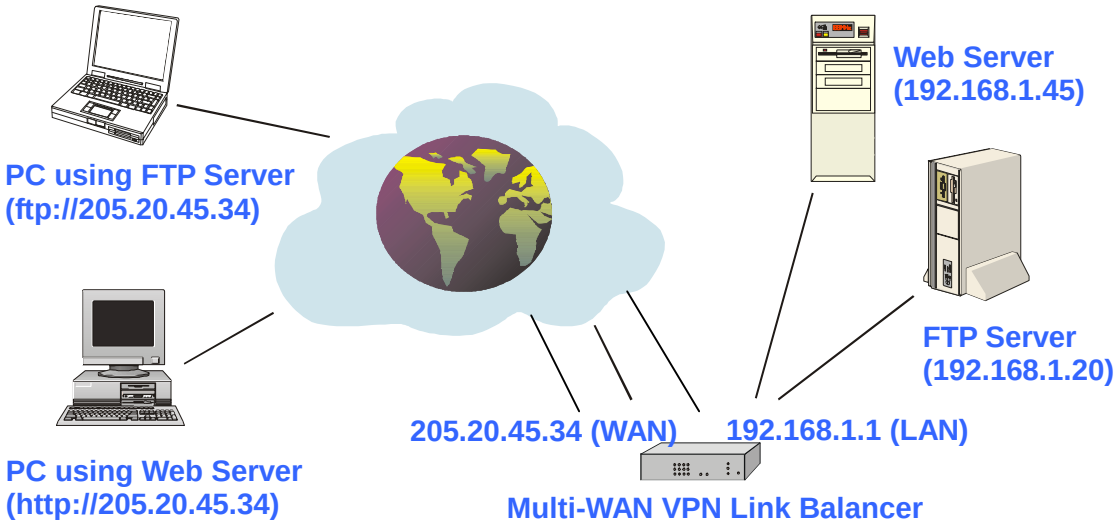

Figure 4-4: Virtual Server

Note that, in this illustration, both Internet users are connecting to the same IP Address but using different protocols.

Connecting to the Virtual Server

Once configured, anyone on the Internet can connect to your Virtual Servers. They must use the Multi-WAN VPN Link Balancer's Internet IP Address (the IP Address allocated by your ISP).
e.g.

`http://205.20.45.34`
`ftp://205.20.45.34`

- To Internet users, all virtual Servers on your LAN have the same IP Address. This IP Address is allocated by your ISP.

- This address should be static, rather than dynamic, to make it easier for Internet users to connect to your Servers. However, you can use the *Dynamic DNS* feature (explained later in this chapter) to allow users to connect to your Virtual Servers using a URL, instead of an IP Address.
  e.g.

  `http://my_domain_name.dyndns.org`
  `ftp://my_domain_name.dyndns.org`

This screen allows you to define your own Server types.

Figure 4-5: Virtual Server

Settings – Virtual Server

Virtual Server Configuration	• **Enable** – The enable checkbox is to Enable or Disable each Virtual server as required. • **Server Name** – Enter a suitable name for this server. (By default, 12 well-known virtual servers have been listed on the Custom Virtual Server List) • **Protocol** – Select the network protocol (TCP/UDP) used by this sever. • **IP Address** – **LAN**, Enter the IP address of the server on your LAN which is running the required Server software. Each Host (server) should have a fixed IP address, or have a reserved IP address. (See the ***Host IP*** section earlier in this Chapter for details on reserving an IP address.) Each Host (server) must be running the appropriate Server software **WAN** – This selection allows this server to bind to any WAN port (1-4), or even bind to all WAN ports together. • **LAN Port Range** – Enter the range of port number used for outgoing traffic from this Server. If only a single port is required, enter it in both fields. • **WAN Port Range** -– Enter the range of port numbers used for incoming traffic to this Server. If only a single port is required, enter it in both fields • **Allowed Remote IP** – It allows only a range of remote side IP addresses to access the virtual servers. The default entry 0.0.0.0 ~ 0.0.0.0, means all remote side IP address can access it.
Buttons	• **Add** – Create a new Virtual Server entry. • **Delete** – Delete the selected entry. • **Update** – Save any changes you have made to the current entry. • **Cancel** – Cancel any changes you have made since the last saved operation.
Virtual Server List	This table shows the details of all Custom Virtual Servers configuration data which have been defined. You can modify their configuration data by selecting and clicking on a row.

Special Application

If you use Internet applications which have non-standard connections or port numbers, you may find that they do not function correctly because they are blocked by the firewall in the Multi-WAN VPN Link Balancer. In this case, you can define the application as a "Special Application" in order to make it work.

Note that the terms "Incoming" and "Outgoing" on this screen refer to traffic from the client (PC) viewpoint

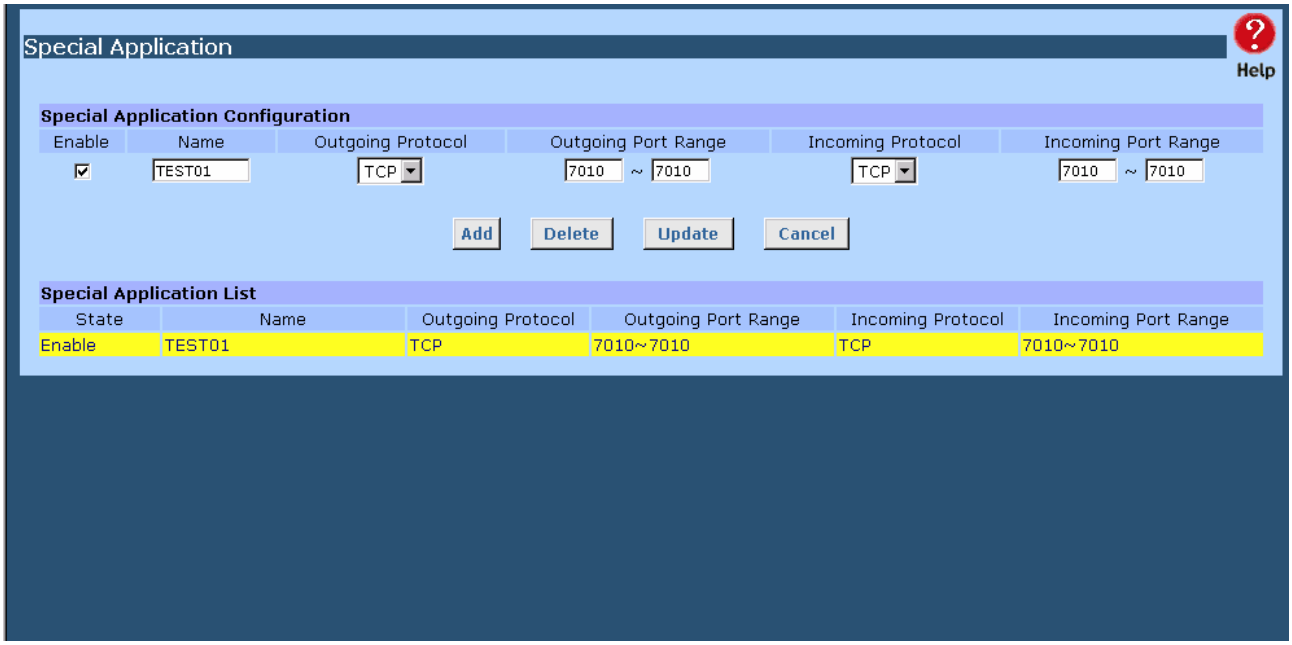

Figure 4-6: Special Application

Settings – Special Application

Special Application Configuration	• **Enable** – Use this to Enable or Disable the Special Application as required • **Name** – Enter a descriptive name to identify the Special Application. • **Outgoing Protocol** –Select the protocol used by the application when sending data to the remote server or PC. • **Outgoing Port Range** – Enter the beginning and end of the range of port numbers used by the application server for data you send. If the application uses a single port number, enter it in both fields. • **Incoming Protocol** – Select the protocol used by the application when receiving data from the remote server or PC. • **Incoming Port Range** –Enter the beginning and end of the range of port numbers used by the application server for data you receive. If the application uses a single port number, enter it in both fields.
Buttons	• **Add** – Create a new Special Application entry. • **Delete** – Delete the selected entry. • **Update** – Save any changes you have made to the current entry. • **Cancel** – Cancel any changes you have made since the last saved operation.
Special Application List	This shows the details of all Special Applications which are currently defined. You can modify its configuration data by selecting and clicking on a row.

Using a Special Application on your PC

- Once the *Special Applications* screen is configured correctly, you can use the application on your PC normally. Remember that only one (1) PC can use each Special application at any time.
- Also, when 1 PC is finished using a particular Special Application, there may need to be a "Time-out" period before another PC can use the same Special Application.
- If an application still cannot function correctly, try using the "DMZ" feature, if possible.

Dynamic DNS

Dynamic DNS is very useful when combined with the *Virtual Server* feature. It allows Internet users to connect to your Virtual Servers using a URL, rather than an IP Address.

This also solves the problem of having a dynamic IP address. With a dynamic IP address, your IP address may change each time you connect to your ISP, making it difficult to connect to you.

You must register for the Dynamic DNS service. The Multi-WAN VPN Link Balancer supports 3 types of service providers:

- Standard client, available at http://www.dyndns.org
  (Other sites may offer the same service, but can not be guaranteed to work)
- TZO at http://www.tzo.com
- 3322 is available in China at http://www.3322.org

To use the Dynamic DNS feature

1. Register for the service from your preferred service provider.
2. Follow the service provider's procedure to have a Domain Name (Host name) allocated to you.
3. Configure the ***Dynamic DNS*** screen, as described below.
4. The Multi-WAN VPN Link Balancer will then automatically update your IP Address recorded by the Dynamic DNS service provider.
5. From the Internet, users will now be able to connect to your Virtual Servers (or DMZ PC) using your Domain name.

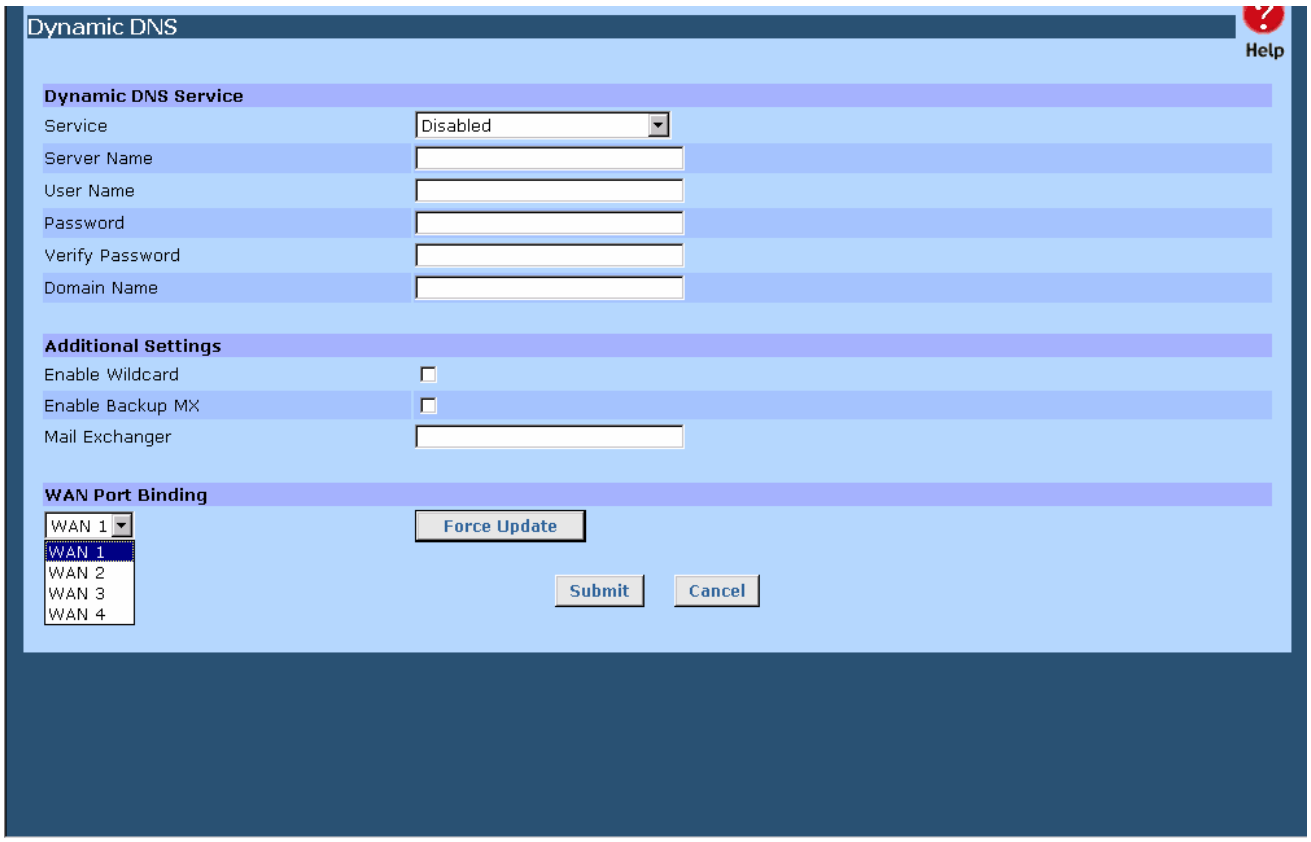

Figure 4-7: Dynamic DNS

Settings – Dynamic DNS

Dynamic DNS Service	This pull-down menu can Enable/Disable the Dynamic DNS feature and select the required service provider. • **Disable** – Dynamic DNS is not used. • **TZO** – Select this to use the TZO service (www.tzo.com). You must configure the *TZO* section of this screen. • **DynDNS** – Select this to use the standard service (from www.dyndns.org or other provider). You must configure the *Standard Client* section of this screen. • **3322(in China)** – This is available in China. It is similar to "DynDNS" • **User Defined DDNS Server** – This is the user defined DDNS server. If the DDNS provider is other than TZO, dyndns.org or 3322.
Additional Settings	These options are available if using the standard client. • **Enable Wildcard** – If selected, traffic sent to sub-domains (of your Domain name) will also be forwarded to you. • **Enable backup MX** – If enabled, you must enter the *Mail Exchanger* address below. • **Mail Exchanger** – If the setting above is enabled, enter the address of the backup Mail Exchanger.

WAN Port Binding	• Select the WAN port used by the Dynamic DNS. • The "Force Update" button will update your record on the Dynamic DNS Server immediately.

Multi DMZ

This feature allows each WAN port IP address to be associated with one (1) computer on your LAN. All outgoing traffic from that PC will be associated with that WAN port IP address. Any traffic sent to that IP address will be forwarded to the specified PC, allowing unrestricted 2-way communication between the "DMZ PC" and other Internet users or Servers.

Note:

The "DMZ PC" is effectively outside the Firewall, making it more vulnerable to hacker attacks or other intrusions. For this reason, you should only enable the DMZ feature when required.

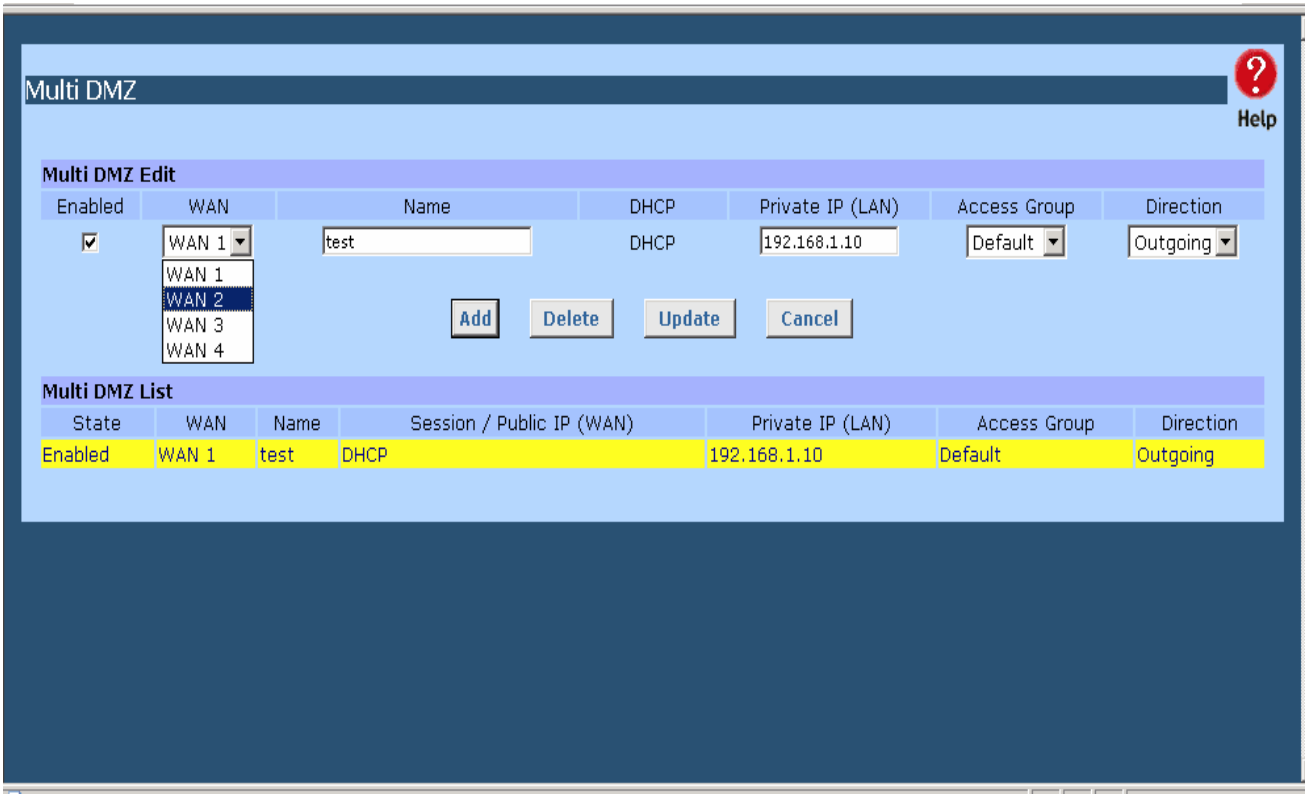

Figure 4-8: Multi DMZ

Settings – Multi DMZ

Multi DMZ Edit	• **Enable** – Use this to enable or disable the DMZ setting, as required. • **WAN** – Select the desired WAN port binding with a particular LAN host. (There are a maximum 8 WAN ports which can be available.) Its connection type may change based on your WAN connection type (Static/DHCP/PPPoE/PPTP). • **Name** – Enter a name to assist you to remember this setting. This name can be anything you choose and will have no effect on the operation. • **Private IP Address (LAN)** – Enter the IP address of the PC you wish to associate with this WAN port IP address. This IP address should be fixed, or reserved. (See the ***Host IP*** section for details on reserving an IP address.) • **Access Group** –You can decide which users will have authorization to use DMZ by defining the groups (Host IP web page) • **Direction** –For DMZ, you can allow inbound only, outbound only, or both inbound and outbound traffic.
Multi DMZ List	Multi DMZ List shows the details of all DMZ configuration data which are currently defined. You can modify its configuration data by selecting and clicking on a row.

UPnP Setup

With the UPnP (Universal Plug & Play) function, you can easily setup and configure an entire network as well as enable detection and control of networked devices and services.

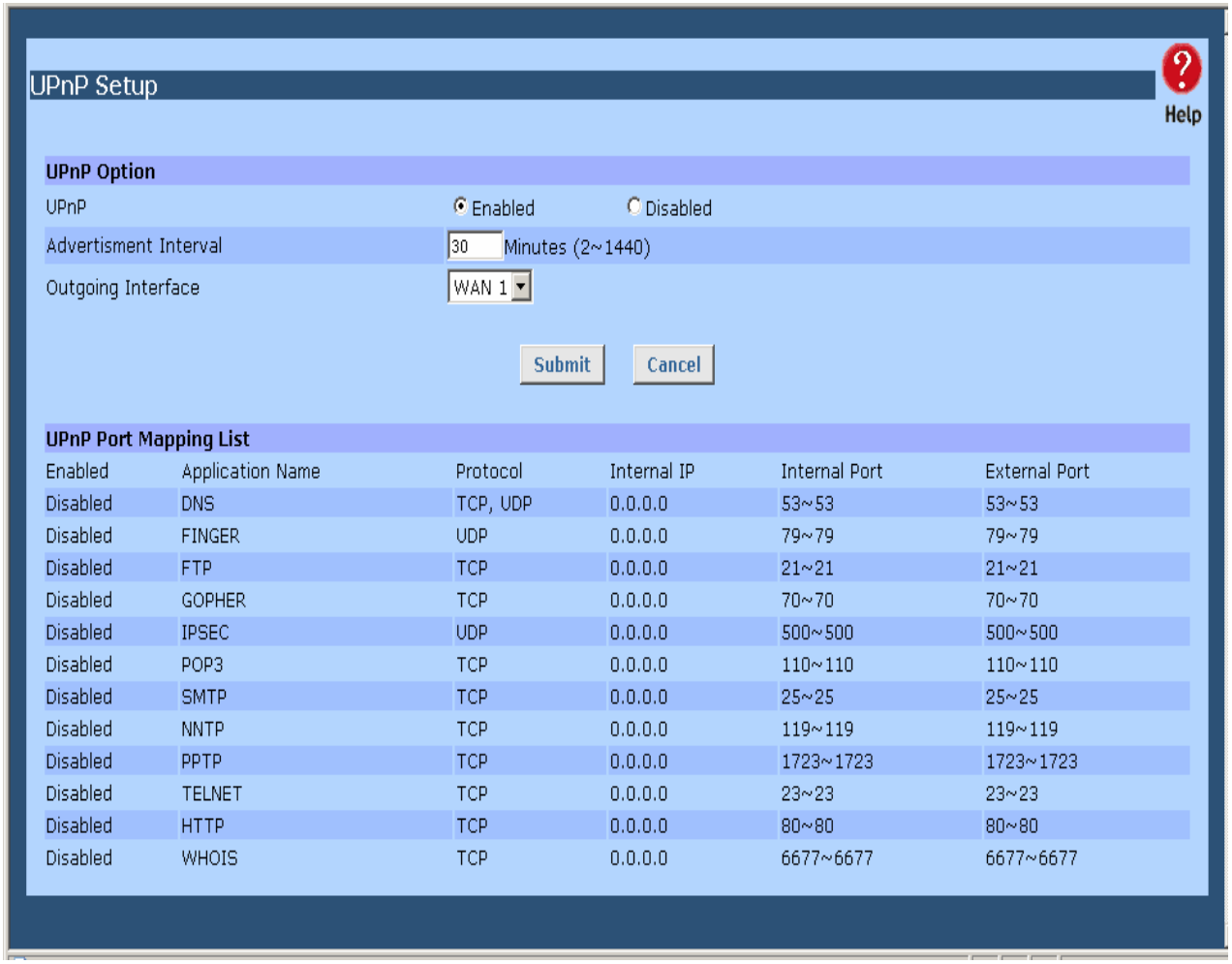

Figure 4-9: UPnP Setup

Settings – UPnP Setup

UPnP Option	• UpnP (Univeral Plug & Play) can be enabled or disabled for automatic device configuration. If disabled (Default), the router will not allow any device to automatically control the resources. • **Advertisement Interval** –The Advertisement Interval is how often the router will broadcast its UPnP information. This value can range from 2 to 1440 minutes. The default interval is for 30 minutes. Shorter time interval will ensure that control points have current device status at the expense of additional network traffic. Longer time interval may compromise the freshness of the device status but can significantly reduce network traffic. • **Outgoing Interface** – Select though which WAN or LAN port you want to send out traffic from UPNP. If the WAN port you select loses its connection, the router attempts to use the other WAN port. If the other WAN port also does no work, the router drop outgoing packets from UPNP.
UpnP Port Mapping List	You can set the dynamic port mappings to Internet gateway via UPnP on Windows XP. This will allow you make a connection between applications and the defined device

NAT Setup

NAT (Network Address Translation) is the technology which allows one (1) WAN (Internet) IP address to be used by multiple LAN users.

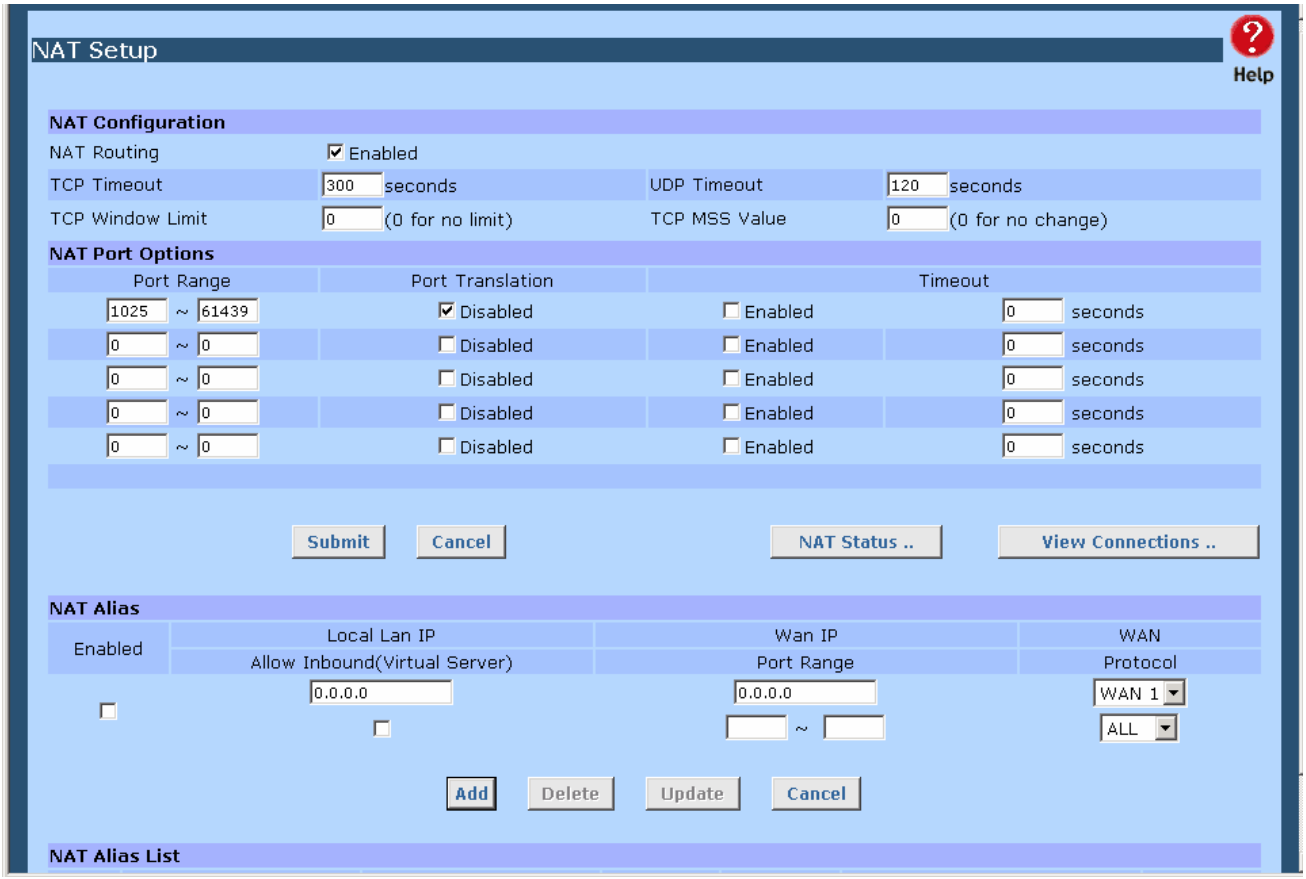

Figure 4-10: NAT Setup

Settings – NAT Setup

NAT Configuration	• **NAT Routing** – You can enable or disable NAT through the check box. If you disable the NAT checkbox, it will act as a bridge or Static Router. Most features will be unavailable. • **TCP Timeout** – Enter the desired value to use on each WAN port. The default is 300 • **UDP Timeout** – Enter the desired value to use on each WAN port. The default is 120 • **TCP Window Limit** – Enter the desired value to use on each WAN port. The default is 0 (no limit). • **TCP MSS Limit** – Enter the required MSS (Maximum Segment Size) to use on each WAN port. The default is 0 (no limit).

NAT Port Option	• **Non-Port-Translation** –To keep the source port number unchanged for TCP/UDP sessions on the specified Port Range. Some special applications do not allow the source port number to be translated. • **Port Range** – The Source Port Number Range for TCP and UDP protocol. • **Specific TCP / UDP Timeout** –To define specific Timeout for TCP/UDP sessions on the specified Port Range.
NAT Alias	For each alias entry the WAN IP acts as an alias of the host with Local LAN IP accessing the Internet via the specified WAN port for the specified protocol packets, i.e. 1-1 NAT. • **Enable** – To activate or deactivate current entry. • **Local LAN IP** –The IP address of the host in LAN that wants to use the specific WAN IP as its source IP. • **WAN IP** – The IP address used as the source IP of the packets sent out from the specified host. • **Protocol** –The protocol that the current rule is applied to. • **WAN** – The WAN port that the current rule is applied to. • **Allow Inbound (Virtual Server)** – Enable check box, can be used as a virtual server through alias WAN port.
NAT Alias List	The List shows NAT Alias that is currently defined.

Advanced Feature

- **External Filters Configuration** – These settings determine whether the Multi-WAN VPN Link Balancer should respond to ICMP (ping) requests received from the WAN port or not.
- **Interface Binding** – Use these settings to ensure that certain traffic is sent by a particular WAN port and thereby a particular ISP account. These settings are only useful on some WAN ports.
- **Protocol & Port Binding** – This allows you to bind any WAN port by selecting the protocol type you want.

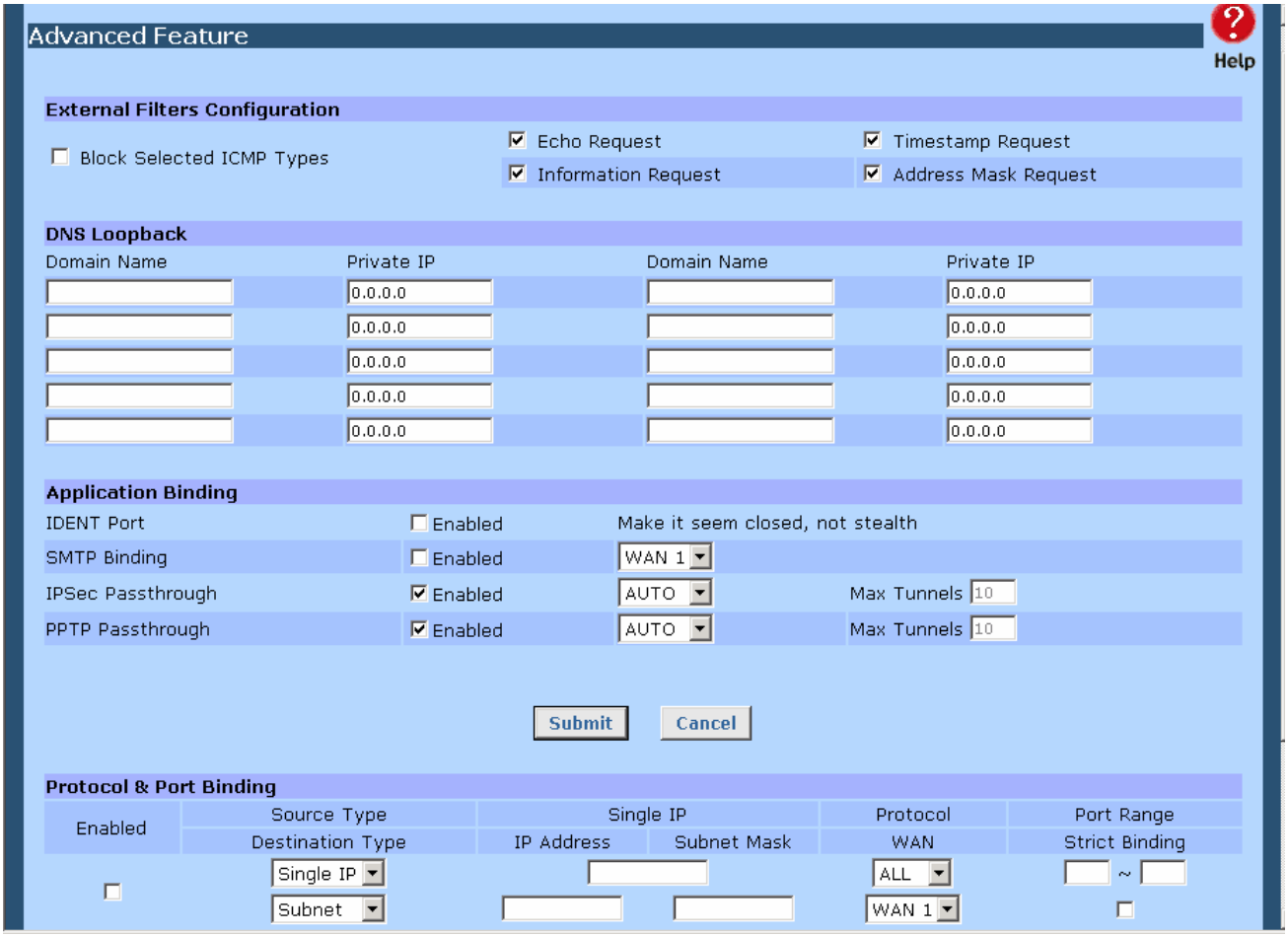

Figure 4-11: Advanced Feature

Settings – Advanced Feature

External Filters Configuration	**Block Selected ICMP Types** – These settings determine whether or not this device should respond to ICMP requests received from the WAN port. If checked, the selected packet types are blocked. Otherwise, the packets are accepted.
DNS Loopback	Used when you have some servers on the LAN and their domain names have already been registered on public DNS. To avoid DNS loop back problems, please enter the following fields: • **Domain Name** – Enter the domain name specified by you for the local server. • **Private IP** – Enter the private IP address of your local server.
Application Binding	• **IDENT Port –** Port 113 is associated with the Internet's (Identification / Authentication) service. When a client program in your computer contacts a remote server for services such as POP, IMAP, SMTP, that remote server sends back a query on port 113. Enable to make this port closed, not stealth. • **SMTP Binding** –To determine if the SMTP packets are binding on the specific WAN port. • **IPSec Passthrough** – To allow IPSec traffic to go through the device via the specific WAN port. If **AUTO** is selected, the device will choose the first available WAN port for the session. **Max Tunnels** is fixed to 10. • **PPTP Passthrough** – To allow PPTP traffic to go through the device via the specific WAN port. If **AUTO** is selected, the device will choose the first available WAN port for the session. **Max Tunnels** is fixed to 10.
Protocol & Port Binding	**Protocol and Port Binding** Use these settings if you wish to ensure that particular traffic is sent by a specific WAN port, and thereby a particular ISP account. • **Enable** - Enable or disable each item as required. • **Source IP** - IP address of source from which packets are sent. • **Destination IP** – IP address of destination to which packets are sent. • **Subnet Mask –** With a subnet mask other than 255.255.255.255, you can make an IP sub-network as your destination. • **Protocol** – Select protocol type used by the traffic you wish to configure. • **Port Range** - Enter the beginning and end of the port range used by the traffic you wish to configure. If only a single port is used, enter the port number in both fields. • **WAN** - Select the WAN port you wish this traffic to use.
Protocol & Port Binding List	This list shows the details of all protocol and port configuration data which are currently defined. You can modify them by clicking on a selected row.

5: Security Management

Overview

- ***Block URL*** – Ability to block a specific website by configuring IP address, URL or Keywords.
- ***Access Filter*** – Ability to block all Internet access, a known port or user defined ports by group access.
- ***Session Limit*** – Ability to limit users Internet access when the device detects new sessions that exceed the maximum value in the sampling time, for example, virus, syn flood, etc.
- ***SysFilter Exception*** – This feature allows you to configure an unrecognized port, allowing those packets to be processed, enabling some programs to run more smoothly. This is also applicable for some future applications that may need this mechanism in order to work well.

Block URL

This feature allows you to block access to undesirable Web sites. You can block by URL, IP address, or Keyword. You can also have different blocking settings for different groups of PCs.

- In operation, every URL is searched to see if it matches or contains any of the URLs or keywords entered here. Then, after a DNS lookup, it determines the IP address of the requested site and checks it against IP address entries on this screen.
- Note that a single IP address may host many Web sites (shared IP). Entering an IP address on this screen will block all Web sites that may be hosted on that IP address.

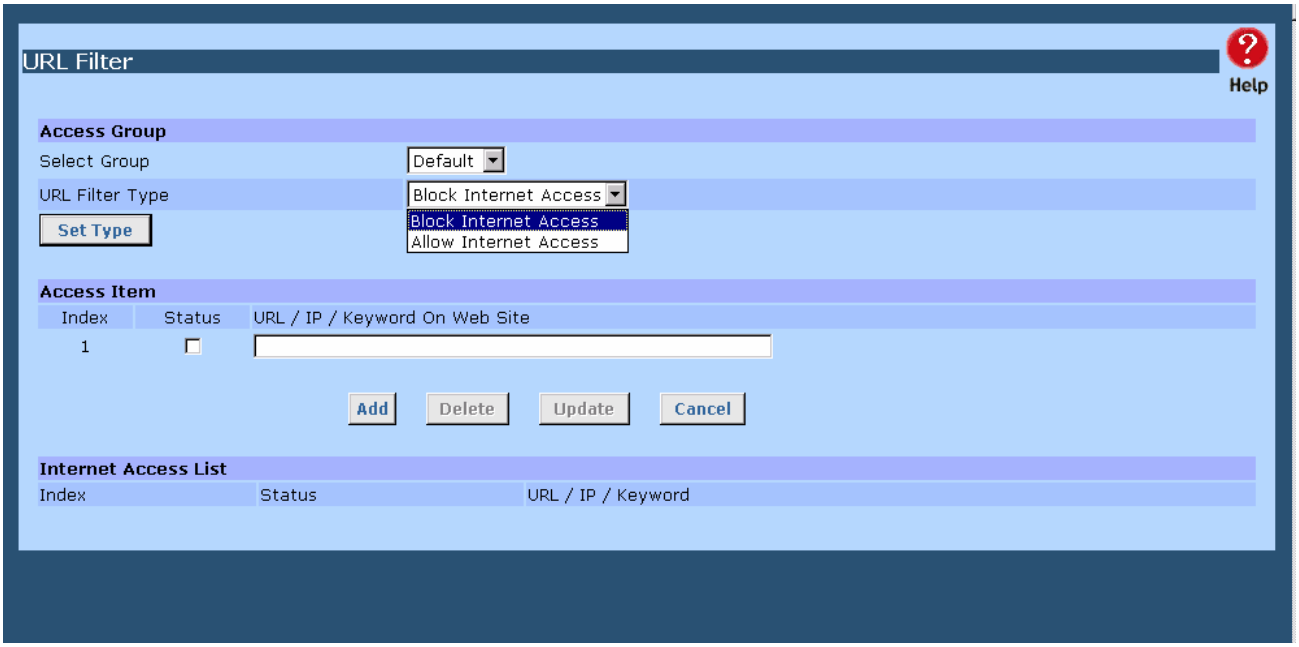

Figure 5-1: Block URL

Settings – Block URL

Access Group	This allows you to have different blocking rules for different Groups of PCs. • All PCs (users) are in the *Default* Group unless moved to another specified group on the ***Host IP*** screen. • If you want the same restrictions to apply to everyone, select *Default* for the Group. In this case, there is no need to enter any Hosts in the ***Host IP*** screen. • If you wish to apply different restrictions on different Groups, select the desired Group, and click the "Select" button. The screen will update the data for the selected Group. • URL List Type – **Block Internet Access**: If you select Black List, It will block the URL that you keep it on Access Item. **Allow Internet Access:** If you are select White List type, it will block the entire URL except you keep it on the Access Item. • **Set Type** – Submit to Block Internet Access or Allow Internet Access List.
Access Item	• **Enable/Disable** – Use this to Enable or Disable each setting as required. • **Block URL/IP/Keyword** – Enter the URL, IP address or Keyword you wish to block.
Internet Access List	The list will display all block rules that you have setup. You can modify it by clicking on a selected row.

Access Filter

The network Administrator can use the Access Filter to gain fine control over the Internet access and applications available to LAN users.

- Five (5) user groups are available and each group can have different access rights assigned to them.
- All PCs (users) are in the *Default* group, unless assigned to another group on the ***Host IP*** screen.

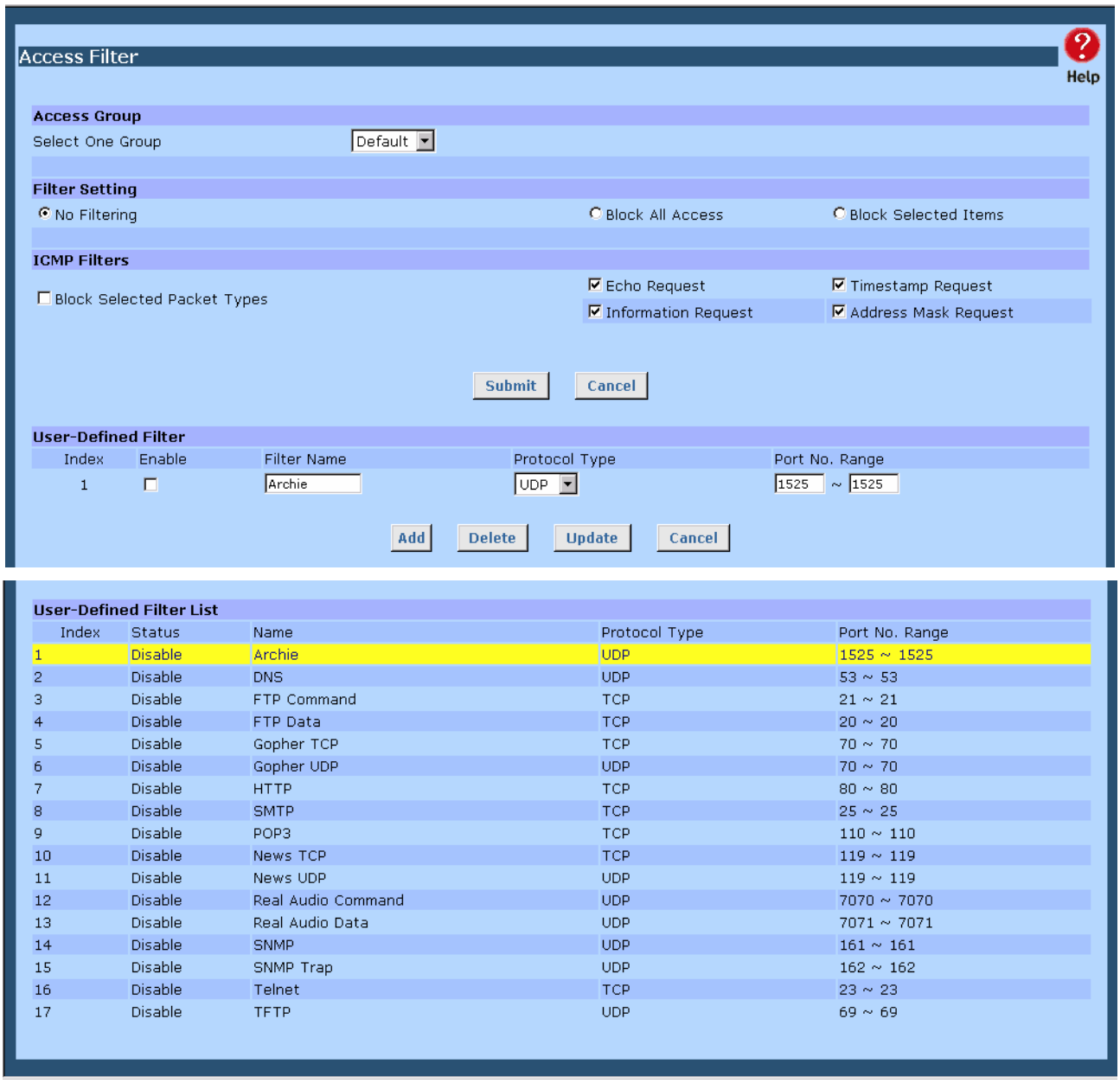

Figure 5-2: Access Filter

Settings – Access Filter

Access Group	This allows you have different access rights for different Groups of PCs. • If you want the same restrictions to apply to everyone, select *Default* for the Group. In this case, there is no need to enter any Hosts on the ***Host IP*** screen. • If you wish to apply different restrictions to different Groups, select the desired Group. The screen will update data for the selected Group.

Filter Setting	Select the desired option for this Group: • **No filtering** – Nothing is blocked, Internet access is not restricted. • **Block All Access** – Everything is blocked, Internet access is not available. • **Block selected items** – Items selected on this screen are blocked. You can block known services by using the checkboxes, or you may define your own filters.
ICMP Filters	If you enable ICMP Filter that means it will block ICMP request packet types specified by users from local host to remote side.
User-Defined Filter	This section is optional. It allows you to define your own filters as required. For each filter, the following information is required: • **Filter Name** – Enter a name for this filter. • **Protocol Type** – Select a protocol type you wish to block. • **Port No. Range** – Enter the range of port numbers used that you wish to block. If only a single port is required, enter it in both fields.
User-Defined Filter List	This List shows the details of all User-Defined Filter configurations which are currently defined. You can modify its configuration data by clicking on a selected row.

Session Limit

This new feature allows to drop the new sessions from both WAN and LAN side, if the number of new sessions exceeds the maximum value set by you in the Sampling Time field.

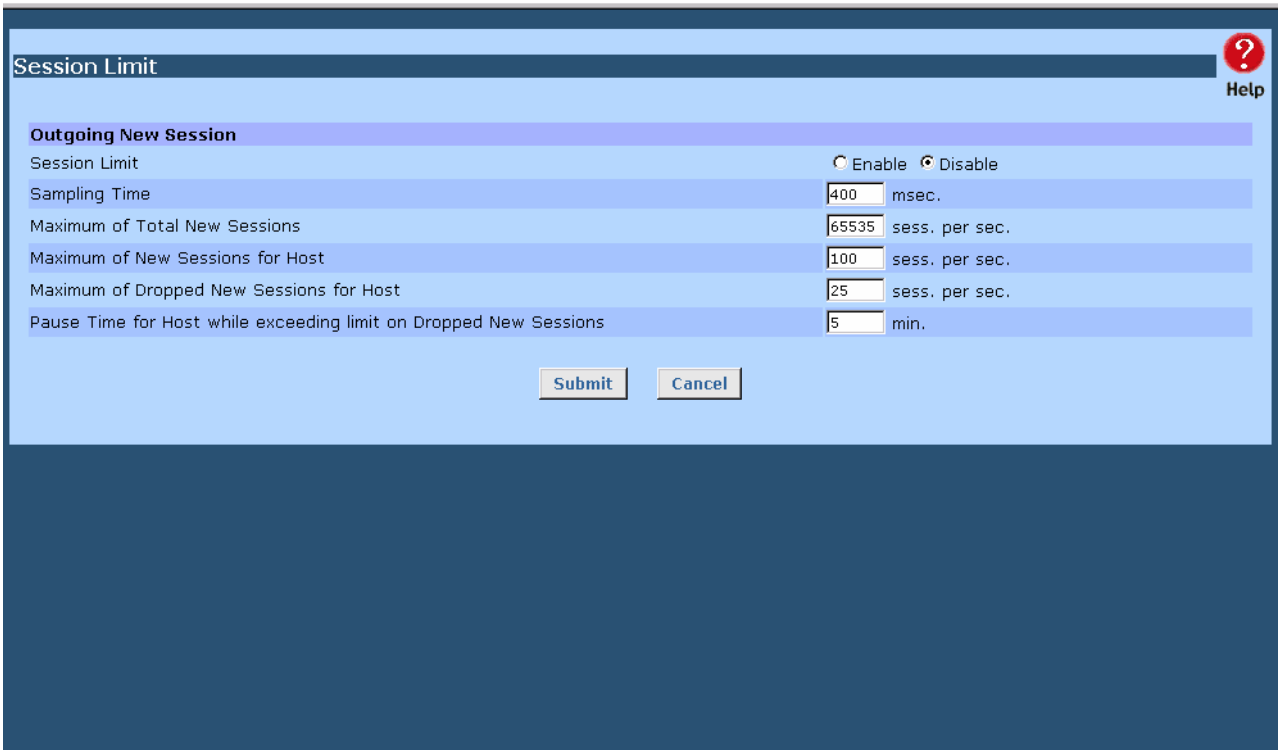

Figure 5-3: Session Limit

Settings – Session Limit

Sampling Time	The time interval specified by you for new sessions. Only the new sessions that have recently occurred are counted according to the sampling time entered. (Default is 400 mil-sec)
Maximum of Total New session	The maximum total number of new sessions in the system which is acceptable in the sampling time. Any new incoming sessions will be dropped after the number of new sessions has been exceeded. (Default: 65535 session/sec)
Maximum of New Sessions for Host	The maximum number of new sessions from the host which is acceptable in the sampling time. Any new incoming sessions will be dropped from this host after the number of new sessions has been exceeded. (Default: 100 session/sec)
Maximum of Dropped New Sessions for Host	If the number of dropped new sessions from the host exceeds the Maximum in the sampling time, any new session from the host will be dropped in the pause time period. (Default: 25 session/sec)
Pause Time for Host while exceeding limit on Dropped New Sessions	Within the pause time period, new session from the suspended host will not be served by the system when the number of dropped new sessions exceeds the defined Maximum. (Default is 5 minutes)

SysFilter Exception

System Filter Exception - This will reject every packet with an unrecognized port to block port scan programs from hackers. This, however, also incurs problems in some situations where servers (e.g. SMTP server port 113) or WAN clients need to send a response packet to verify the activity of their communication peers.

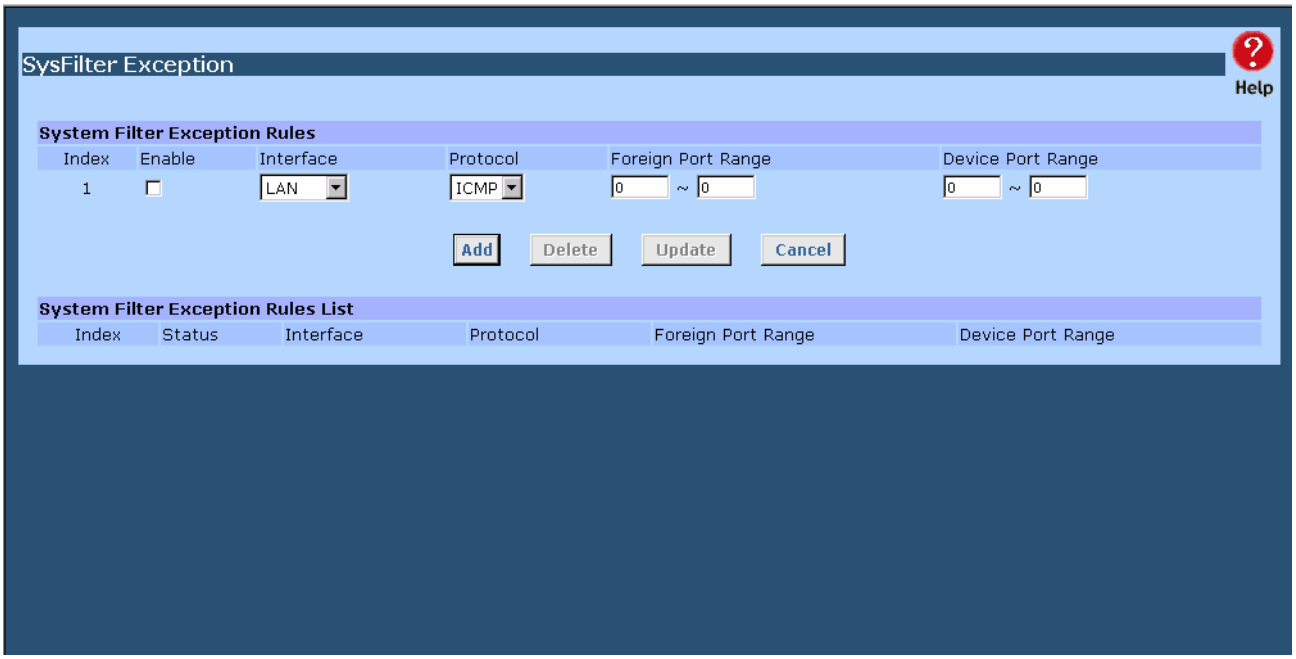

Figure 5-4: SysFilter Exception

Settings –SysFilter Exception

System Filter Exception Rules	• **Enable** – If check box is marked, it will enable System Filter Exception • **Interface** – You can select LAN, any WAN port or ALL interfaces from which a packet originates. • **Protocol** – The packet type (selected in the above Interface) which will be directly processed by this device. • **Foreign Port Range** – Enter the beginning and end of the foreign port range used by the traffic you wish to configure. If only a single port is used, enter the port number in both fields. • **Device Port Range** – Enter the beginning and end of the device port range used by the traffic you wish to configure. If only a single port is used, enter the port number in both fields.
System Filter Exception Rules List	The list will display the details of all System Filter Exception Rules that you have setup. You can modify data by clicking on a selected row.

6: VPN Configuration

Overview

Virtual Private Network (VPN) uses encryption to create the connection between two end points (computers or networks). It allows private data to be sent securely over a public network or the Internet without the risk of outside intruders gaining unauthorized access. VPN establishes a private network that can send data securely between two networks. We call this by creating a “tunnel”. A VPN tunnel connects the two PCs or networks

Note: The VPN Load Balancer uses industry standard IPSec encryption. However, due to the variations in how manufactures interpret these standards, many VPN products are not interoperable. Although the Multi-WAN VPN Link Balancer can interoperate with many other VPN products, it is not possible for the Multi-WAN VPN Link Balancer to provide specific technical support for every other product.

IKE Global Setup

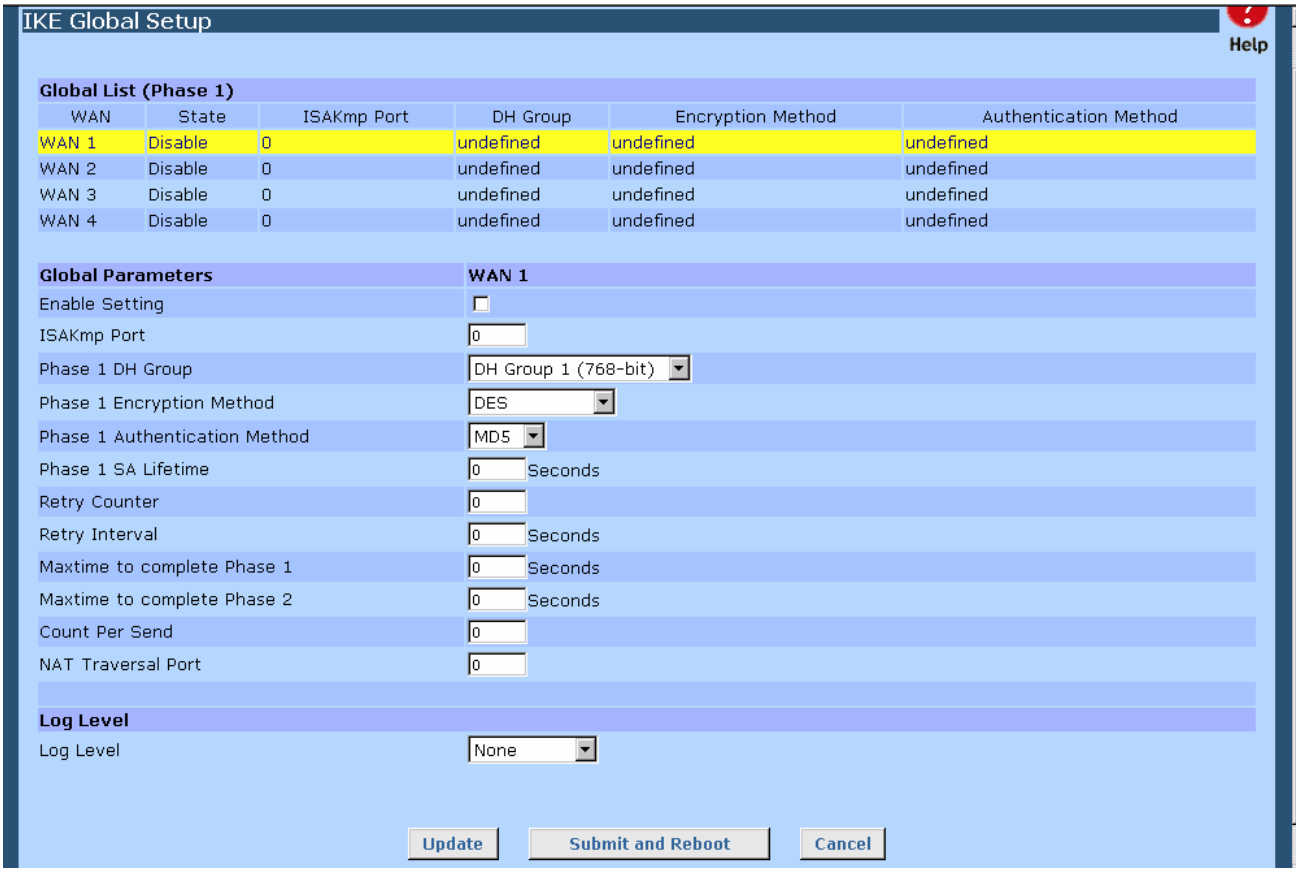

Figure 6-1: IKE Global Setup

Settings – IKE Global Setup

Global List (Phase 1)	The list will only show the approximate information of all Global Settings on each WAN port. You can modify it by clicking on a selected row.
Global Parameters	• **Enable Setting** – If set to Enable, it enables the VPN function to work. • **ISAkmp Port** – Internet Security Association and Key Protocol Management (ISAkmp) is designed to negotiate, establish, modify and delete security associations and their attributes. By default, it is assigned UDP port 500 by the IANA. You can set it to use a port other than port 500. The remote IPsec site will attempt to connect on it. • **Phase 1 DH Group** – There are three levels of cryptography from the Diffie-Hellman group. The DH method illustrates key generation using public key cryptography. It uses the public and secret key information held by both users to generate a key. • **Phase 1 Encryption Method** – There are three data encryption methods available: DES, 3DES and AES. • **Phase 1 Authentication Method** – There are two authentication methods available: MD5 and SHA1 (Secure Hash Algorithm) • **Phase 1 SA Life Time** – By default the Security Association lifetime is 28800 seconds. When it is expired, a new key is re-negotiated. During the negotiation period, the VPN tunnel isn't available. • **Retry Counter** – This indicates how many times the process of Phase 1 will be restarted if it's unsuccessful. There will be an error message in the VPN log once it is expired. • **Retry Interval** – This indicates the time period between two consecutive retries. • **Maxtime to complete Phase 1** – This indicates the maximum time allowed for negotiation in Phase 1. If it expires, it is recommended to increase the Maxtime period or reduce the DH group level. Default value is 30 sec. • **Maxtime to complete Phase 2** – It indicates the maximum time allowed for negotiation in Phase 2. If it expires, it is recommended to increase the Maxtime period or reduce the DH group level. Default value is 30 sec. • **Count Per Send** – This indicates the maximum amount of duplicate packets to be resent if the remote side does not respond to the first packet. • **Force Deletion after Expiry** – When set to *Enable,* once SA has expired, the tunnel session will be removed and all related resources will be cleared.
Log Level	This function allows you to select which information you want to see on the VPN log. It has six different message levels: None, Critical, Error, Warning, Information and Debug.

Planning the VPN

When planning your VPN, you must make the following choices first:

1. If the remote site is a LAN network, the two end-point networks must have different LAN IP address ranges. If the remote end-point is a single PC running a VPN client, its destination address must be a single IP address with subnet mask of 255.255.255.255
2. Will you be using the Internet Key Exchange (IKE) setup, or Manual Keying? Whichever method is used, you must specify each phase of the connection.
3. At least one side must have a fixed IP address. The other side with a dynamic IP address must always be the initiator of the connection.
4. What encryption level will you use (DES, 3DES or AES)?
5. What authentication method will you use (MD5, SHA1 or SHA2)?

IPSec Policy Setup

The VPN Policy Setup is to define the VPN phase 2 policy including the encryption and authentication method. Once you have finished the configuration, you can press the “Connect” button to make the VPN connection. You can also press the “Set Options” button for advanced setting details of VPN policy.

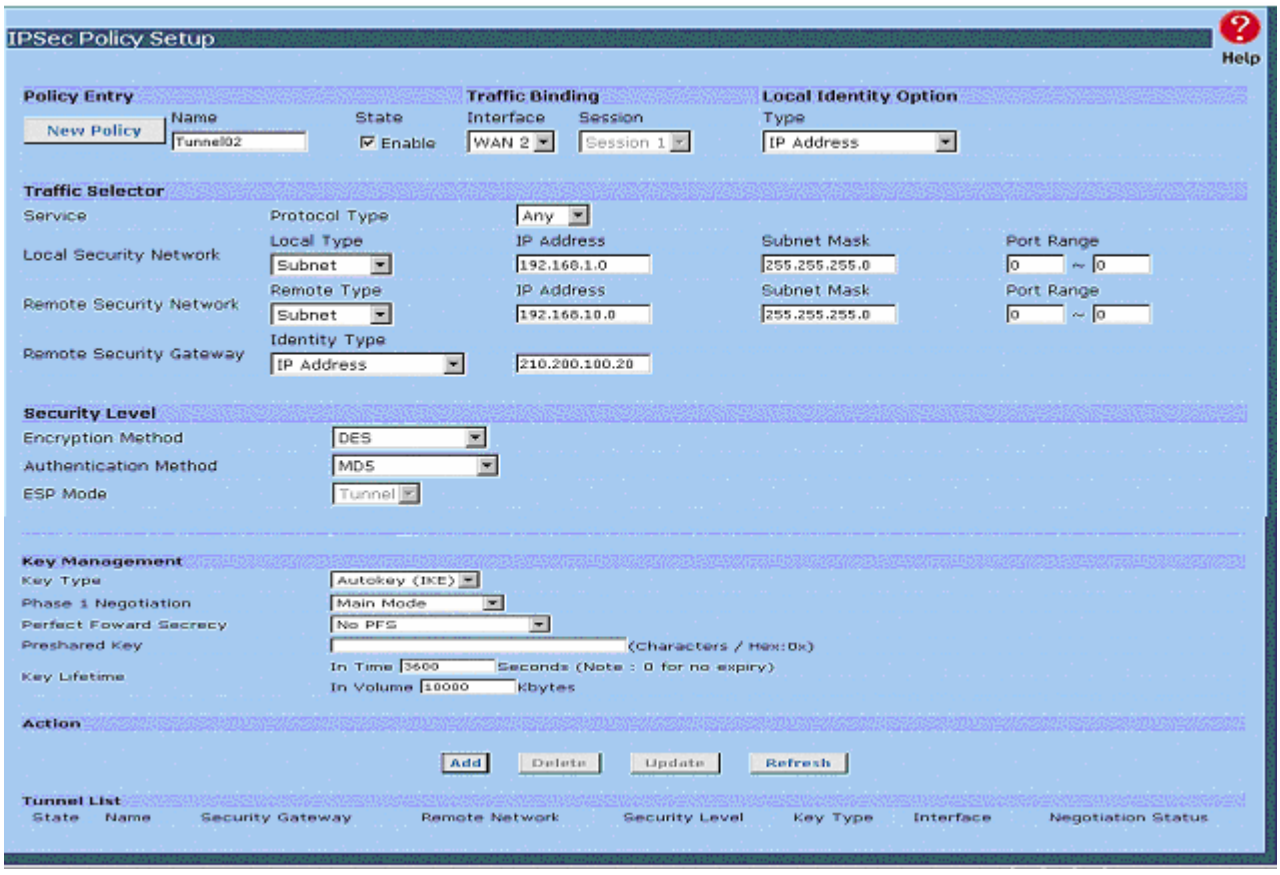

Figure 6-2: IPSec Policy Setup

Settings – IPSec Policy Setup

IPSec Traffic Binding	• **Tunnel Name** – In order to distinguish the tunnel, you have to give "Tunnel" a name.
	• **Tunnel** – If set to *Enable*, this will allow the tunnel to connect.
	• **WAN port** – You can choose any WAN port to make the VPN connection.
	• **PPPoE Session** – If you are using a multi-session PPPoE connection, you can select which PPPoE session will create a VPN tunnel between two sites.
	• **Local Identity Type** – You can select how the router will identify itself to the destination VPN site. There are three options to select from:
	  • **WAN IP address** – This allows the authentication by using its public IP address.
	  • **Domain Name** – This allows the authentication by using a domain name.
	  • **Distinguished Name** – This allows the authentication by using a distinguished name such as an email address or alpha-numeric characters.

Traffic Selector	• **Service** – **Protocol Type:** You can choose TCP, UDP, ICMP or GRE protocol as your connection protocol. By default the protocol type is "Any". • **Local Security Network** – These entries identify the private network on this VPN gateway - the hosts of which can use the LAN-to-LAN connection. You can choose a single IP address, the subnet, or a selected IP range to make VPN LAN-to-LAN connection. • **Remote Security Network** – These entries identify the private network on the remote peer VPN gateway whose hosts can use the LAN-to-LAN connection. You can choose a single IP address, the subnet, or a selected IP range to make VPN connection • **Remote Security Gateway** – You can select either the remote side by a domain name, a remote side IP address (WAN IP address) or a distinguished name as your remote side security gateway.
Security Level	• **Encryption Method** – Specifies the encryption mechanism to use. Data encryption makes the data unreadable if intercepted. There are three encryption methods available: DES, 3DES and AES. The default setting is *null*. • **Authentication Method** – Specifies the packets authentication mechanism to use. Packets authentication confirms if the data's source is correct or not. There are three authentication methods available - MD5, SHA1 and SHA2. • **ESP Mode** – Only *Tunnel Mode* is available. It offers the most protection against an intruder trying to intercept VPN packets.

Key Management	**Key Type** – Two key types are available for the key exchange management - Manual Key and Auto Key: • **Manual Key** – If manual key is selected, no key negotiation is needed. The following fields to be set are: 1. **Encryption Key** –This field specifies a key to encrypt and decrypt IP traffic. 2. **Authentication Key** – This field specifies a key to use to authenticate IP traffic. 3. **Inbound/out bound SPI (Security Parameter Index)** – This information is carried on the ESP header. Each tunnel must have a unique inbound and outbound SPI and no two tunnels share the same SPI. Note that the Inbound SPI must match the other router's outbound SPI. • **AutoKey (IKE)** – There are two types of operation modes which can be used in Phase 1 Negotiation: 1. **Main mode** – Accomplishes a Phase 1 IKE exchange by establishing a secure channel. 2. **Aggressive Mode** – This is another way of accomplishing a phase one exchange. It is faster and simpler than Main Mode but does not provide identity protection for the negotiating nodes. • **Perfect Forward Secrecy (PFS)** – If PFS is enabled, Phase 2 IKE negotiation will generate new key data for IP traffic encryption & authentication. If set to *Enable*, a hacker using brute force in an attempt to break encryption keys is not able to obtain other or future IPSec keys. • **Preshared Key** – This field is used to authenticate the remote IKE peer. It is a "pass code" or "password" which must be the same one used between both the local site and remote site. Otherwise the VPN tunnel will not be established. • **Key Lifetime** – This specifies the lifetime of the IKE generated Key. If the time expires or passed data exceeds the allowed volume, a new key will be renegotiated. By default, 0 is set for *No Limit*.
Security Association List	The list will display the details of all Policy Setup configuration data that you have entered. Modification can be made by clicking on a selected row.

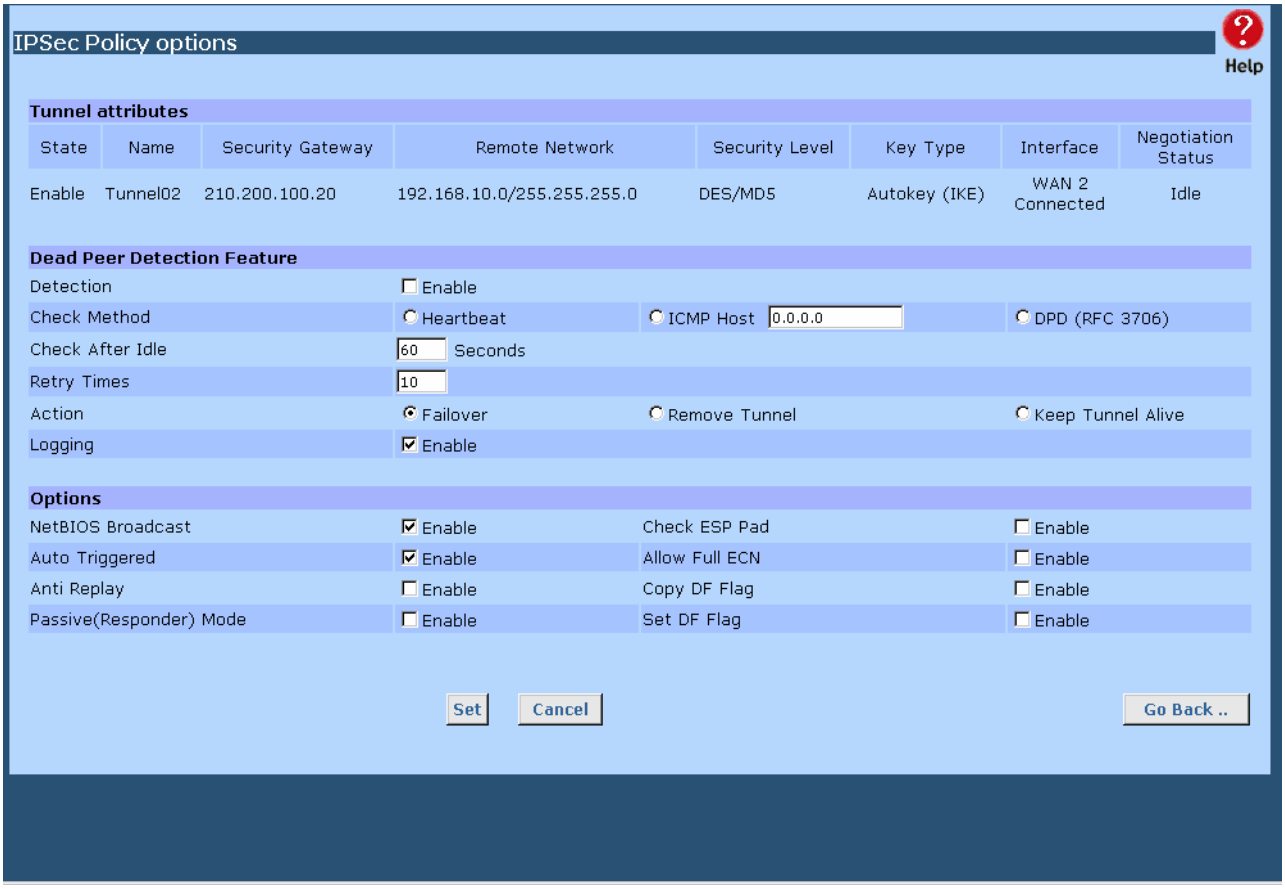

Figure 6-3: IPSec Policy Options

Settings – IPSec Policy Options

Dead Peer Detection Feature	• **Dead Peer Detection (DPD)** – If set to *Enable*, a device will periodically send HELLO/ACK messages to check if the tunnel is alive when both peers of a VPN tunnel provide DPD mechanism. Once a dead peer is detected, a device will end the connection so it can be re-established. This is the primary method of VPN failover or backup. • **Detection** – If set to *Enable***,** this will enable the following Check Method which you have selected to work: • **Check Method**: 1. **Heartbeat** – Sends a unidirectional (‘*HELLO’* only) message to determine connection aliveness. 2. **ICMP Host** – It uses **ICMP** packets to determine connection aliveness 3. **DPD (RFC 3706)** – Uses a bi-directional (*‘HELLO/ACK’*) message to determine connection aliveness. • **Check After Idle** – Indicates the time period in which no traffic

	passes - a *Detection* packet is sent to the peer. • **Retry Times** – The number of times a device will attempt to send the Detection packet before the *Check After Idle* time expires. • **Action** – This will execute one of the following actions after the Detection is determined: *Failover* - ignores the dead tunnel. *Remove Tunnel* - disconnects the dead tunnel. *Keep Tunnel Alive* - attempts to keep the tunnel alive. • **Logging** – If set to Enable, all DPD activity of will show up in the VPN log.
Options	• **NetBIOS Broadcast** – This option is used to forward NetBIOS packets across the Internet from remote side to local side and vice versa. When enabled, the remote side computer can be reached by a host name. • **Auto Triggered** – If set to *Enable*, a device will automatically attempt to connect the remote VPN gateway without any user input. • **Anti Replay** – This ensures that IP packet-level security is kept track of in order. • **Passive (Responder) Mode** – When enabled, the tunnel state will remain idle until an attempt is made to connect to the remote side. This setting will override the *Auto Triggered* option. • **Check ESP Pad** – If set to *Enable*, a device will check the ESP (Encapsulating Security Payload) padding of each packet. ESP is a key protocol in the IPSec architecture which is designed to provide a mix of security services in IPv4 and IPv6. • **Allow Full ECN** – If set to *Enable*, it will allow full Explicit Congestion Notification (ECN). ECN is a standard proposed by the IETF that will minimizes congestion on a network and prevent the gateway from dropping data packets. • **Copy DF Flag** – When an IP packet is encapsulated as payload inside another IP packet, some of the outer header fields can be newly written while others are determined by the inner header. Among these fields is the IP DF (Do not Fragment) flag. When the inner packet DF flag is clear, the outer packet may copy it or set it. However, when the inner DF flag is set, the outer header MUST copy it. • **Set DF Flag-** If the DF (Do not Fragment) flag is set; it means that the fragmentation of this packet at the IP level is not permitted.

Mesh Group Setup

The Multi-WAN VPN Link Balancer not only provides VPN failover and backup but is also capable of offering VPN load balance.

If you have setup IPSec policy on the “IPSec Policy Setup” web page, then you don’t have to enter IPSec policy setup again here. You can press the “**Scan Policies**” button to copy the IPSec Policy into the Mesh Group Setup web page. You also can configure your IPSec Policy on the Mesh Group web page by pressing the “**Create**” button. To use the VPN load balance option, it is necessary to use a static IP.

For configuring Mesh Group Setup you can refer to the IPSec Policy Setup:

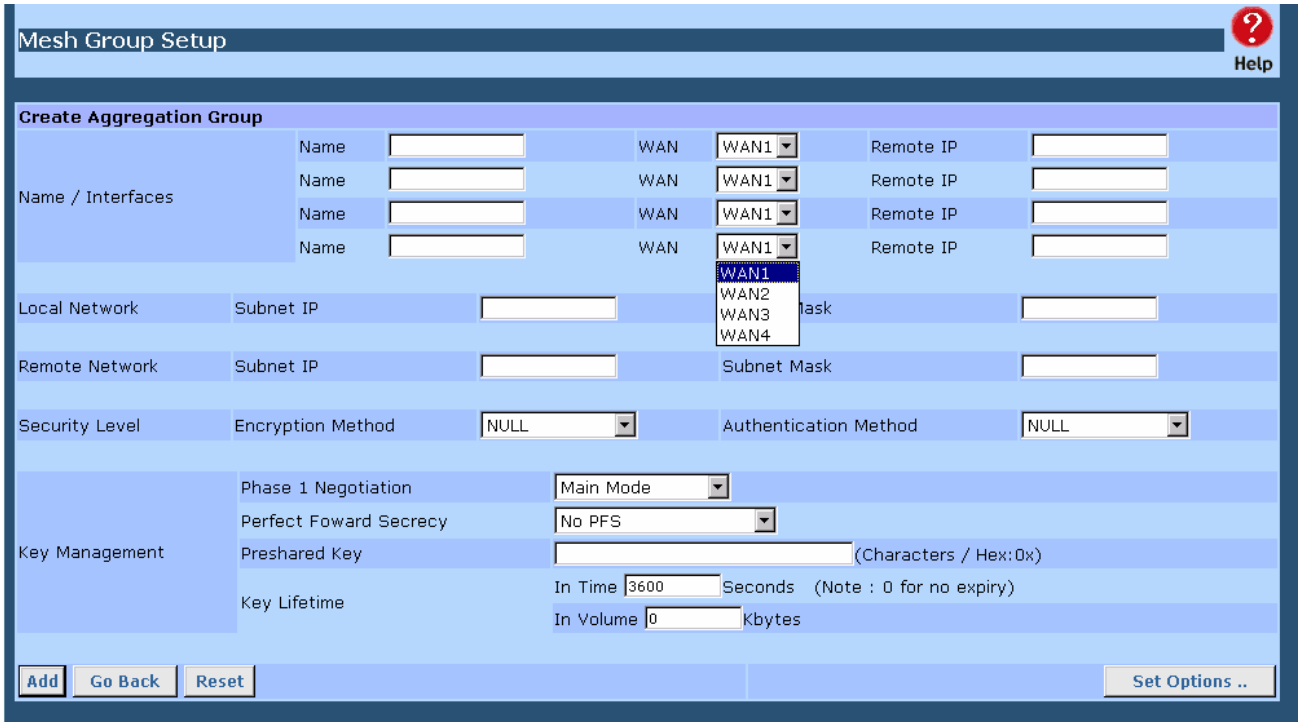

Figure 6-4: Mesh Group Setup

Once you have added your VPN Policy to the Mesh Group, you can set up your Mesh Group through the VPN Mesh Group Configuration.

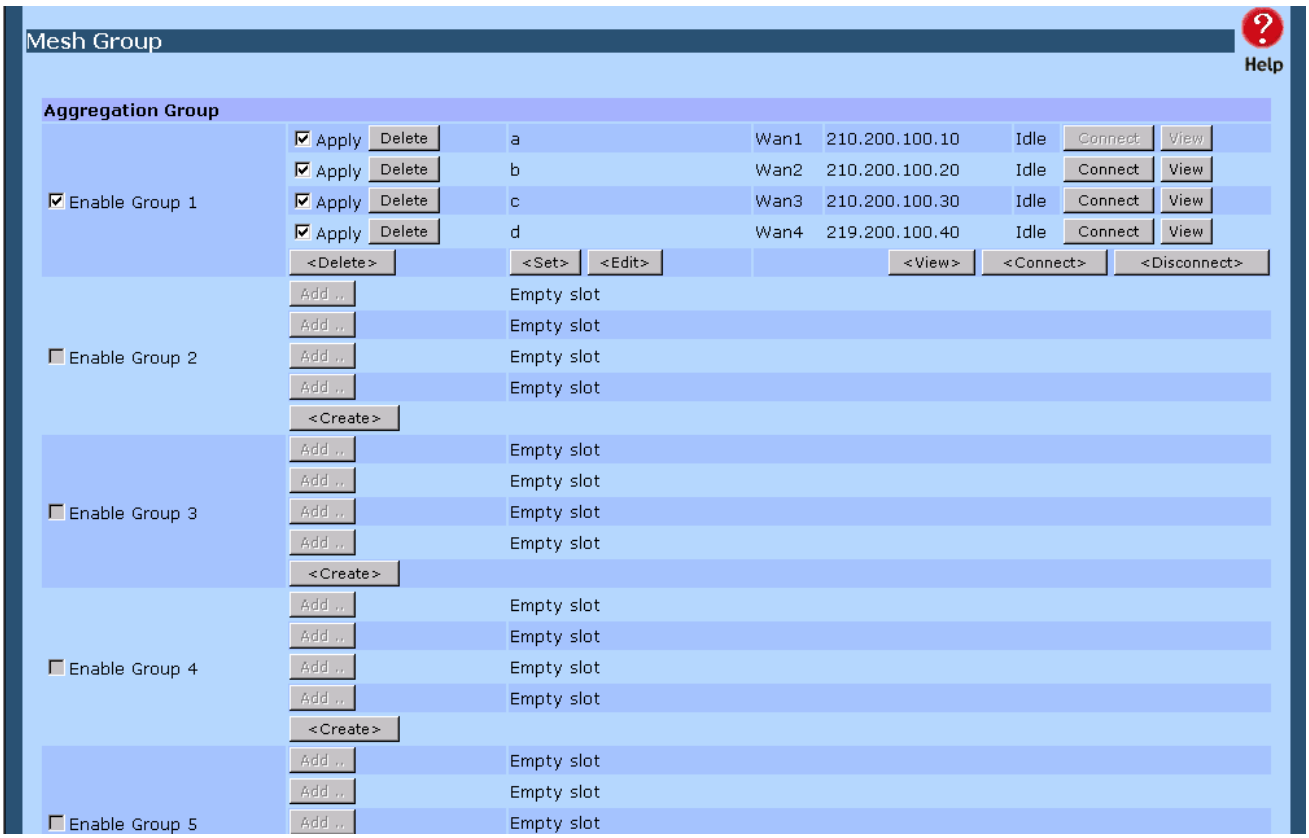

Figure 6-5: Mesh Group Configuration

Settings –Mesh Group Configuration

Aggregation Group	This will display all the VPN connections that are using for VPN load balancing. You should enable the check box before you make a VPN load balance connection. • **Delete Button** – This button can delete one or all IPSec Policies. • **Set Button** – Once you have enabled/disabled the check box, you have to press the *Set* button to submit it. • **Edit Button** – The *Edit* button will let you edit the IPSec policy. • **View Button** – This will let you monitor the connection status. • **Connection Button** – Allows you connect or disconnect the VPN manually,

VPN Logs

You can monitor the VPN status through the VPN Logs web page. The log level (priority) can be chosen from the VPN IKE Global Settings web page.

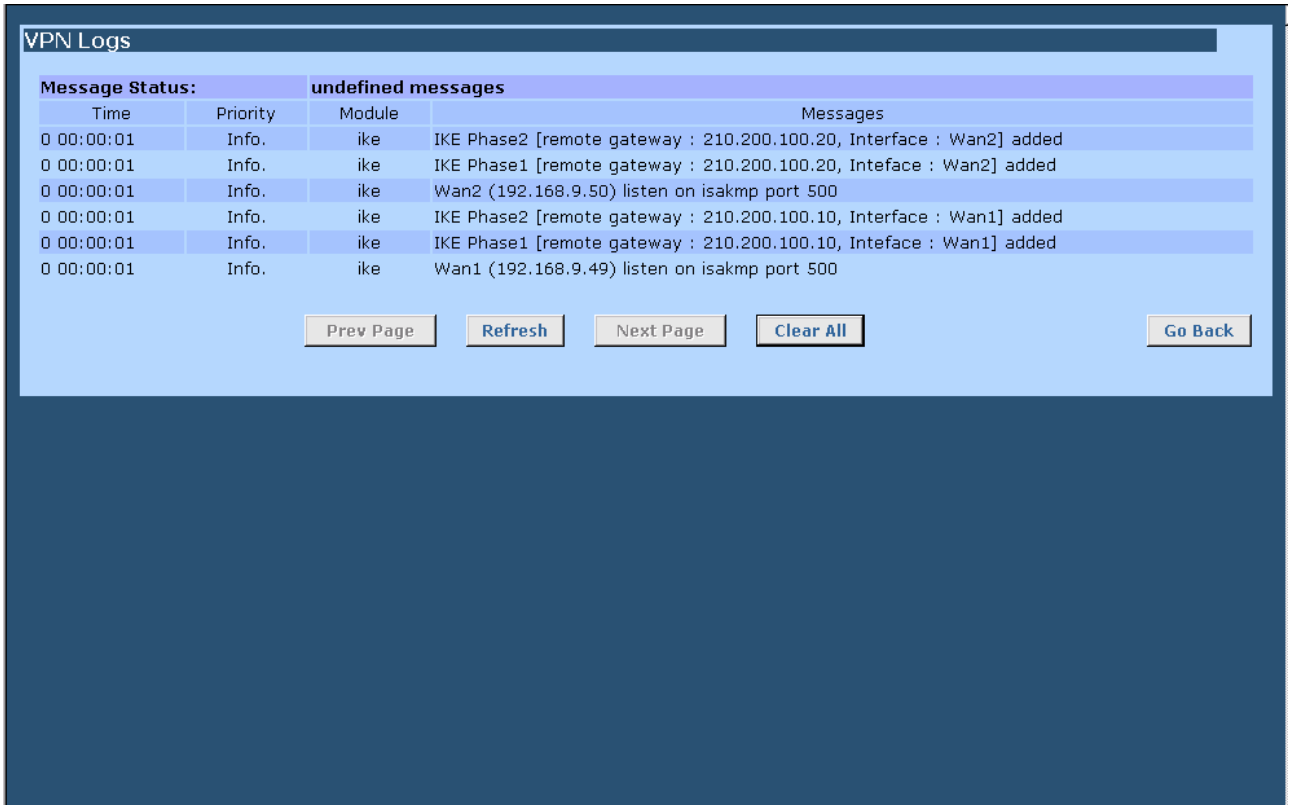
VPN Logs
Message Status:
undefined messages
Time
Priority
Module
Messages
0 00:00:01 Info. ike IKE Phase2 [remote gateway : 210.200.100.20, Interface : Wan2] added
0 00:00:01 Info. ike IKE Phase1 [remote gateway : 210.200.100.20, Inteface : Wan2] added
0 00:00:01 Info. ike Wan2 (192.168.9.50) listen on isakmp port 500
0 00:00:01 Info. ike IKE Phase2 [remote gateway : 210.200.100.10, Interface : Wan1] added
0 00:00:01 Info. ike IKE Phase1 [remote gateway : 210.200.100.10, Inteface : Wan1] added
0 00:00:01 Info. ike Wan1 (192.168.9.49) listen on isakmp port 500
Prev Page
Refresh
Next Page
Clear All
Go Back

Figure 6-6: VPN Logs

Data – VPN Logs

Message Status	• **Time** – Indicates when the message was created according to system time. • **Priority** – Indicates the priority level of a message for analysis.
Undefined Messages	• **Module –** Denotes the module responsible for the message sent in the IPSec architecture. • **Messages –** Displays some information describing the event that happened.

7: QoS Configuration

Overview

The Load Balancer provides QoS, which supports the high quality of network service.
Because it will classify outgoing packets based on some policies defined by users, make some real-time applications to get better response or performance.

QoS Setup

The following web page management are guiding you how to setup QoS and make QoS work.

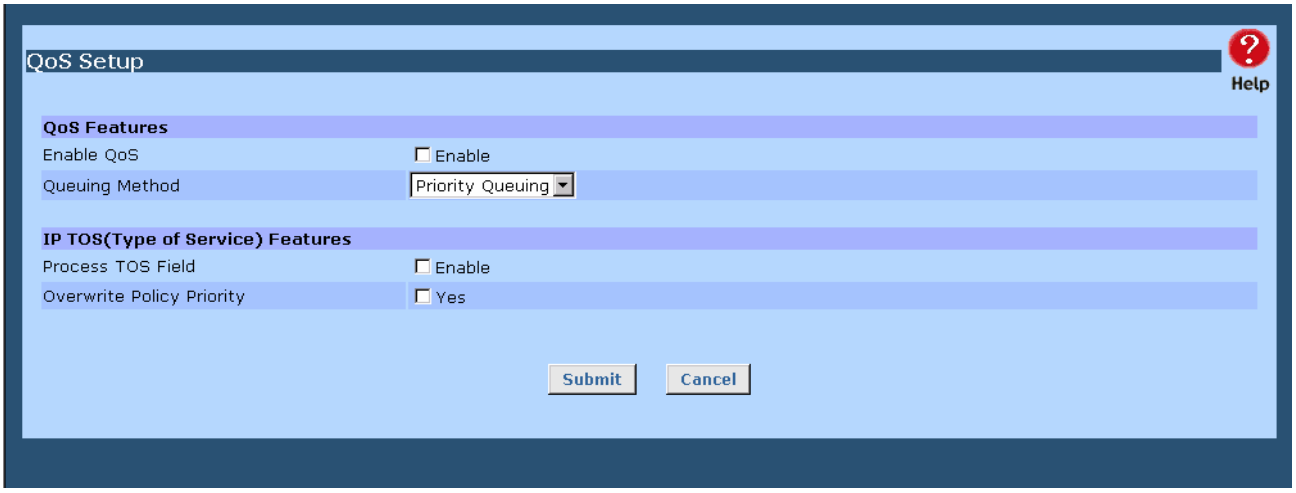

Figure 7-1:QoS Setup

Data – QoS Setup.

QoS Feature	• **Enable QoS** – Users can choose to Enable QoS (Quality of Service). If set to "enable" QoS, the QoS will allow higher priority packets to pass through the device • **Queuing Method** –The methods for managing your queue. "Priority Queuing" is one of the first queuing variations to be widely implemented. This is based on the concept that certain types of traffic can be identified and shuffled to the front of the output queue so that some traffic is always transmitted ahead of other types of traffic.

IP TOS (Type of Service) Feature	• **Process TOS Field** –An 8 bits field in the IP packet header designed to contain values indicating how each packet should be handled in the network. If you choose "enable" then it will enable this function to process IP Type of Service field. • **Overwrite policy priority** – Choose “yes” to set the priority of TOS field in IP packet overwrite the priority defined in policy configuration

Policy Configuration

Setting the **QoS** policy can assign received packets a higher/lower priority (based on your configuration) to pass through this device. You can define some policies which classify received packets based on source/destination IP, MAC, port and protocol type. This feature is useful when the WAN link is very busy or congested or when using special applications that need real time services such as Internet phone, video conference...etc.

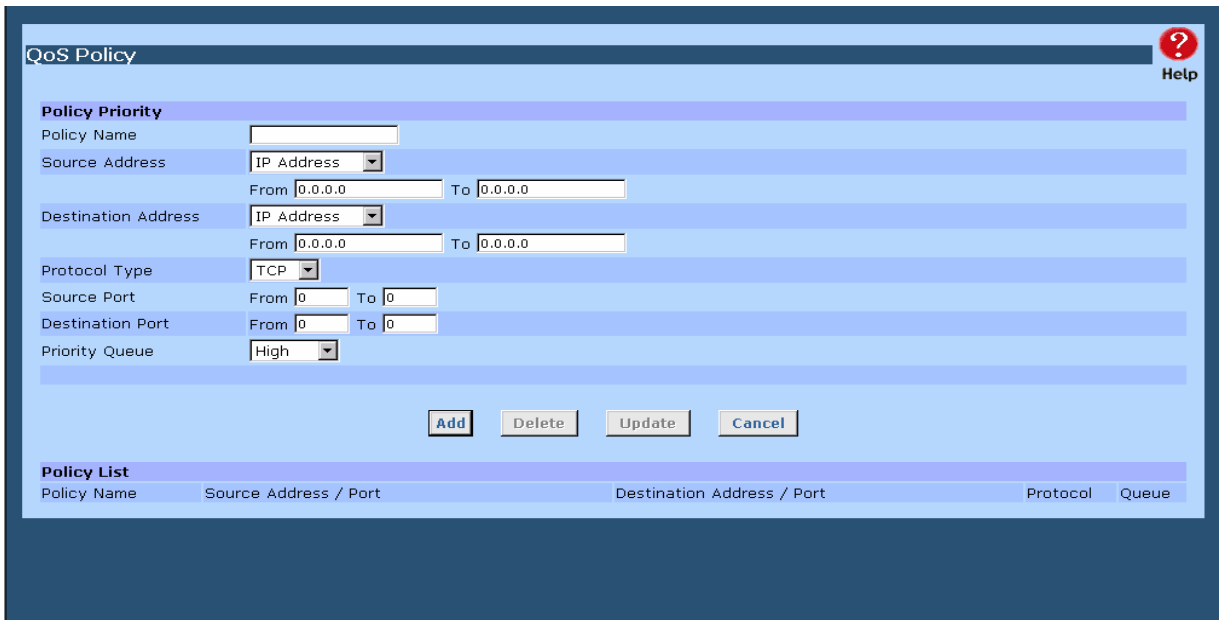

Figure 7-2: Policy Configuration

Data – Policy Configuration.

Policy Priority	• **Policy Name** –The name of a policy which is used to classify the received packets based on the following types for your memory. • **Source/Destination Address, Port** – Specify a packet based on source/destination address or port. Address has two types: IP address and MAC address. By default, the IP address is 0.0.0.0 for all IP Addresses but the MAC address is 00-00-00-00-00-00 which cannot be used to classify. Port and Protocol Type define all packets for special applications. • **Protocol Type** – The field defines traffic packet type, i.e. IP,TCP and UDP. • **Priority Queue** –This device supports four queues. When a packet meets a policy rule requirement, it will be put into the responding queue. Otherwise it is assigned the lowest priority to pass through

8: Bandwidth Configuration

Overview

The Multi-WAN VPN Link Balancer incorporates a QoS (Quality of Service) utility to provide high quality network support service.

Because it classifies outgoing packets based on policies defined by users, real-time applications should respond or perform better.

Bandwidth Setup

The following web page instructs you on setting up and enabling QoS.

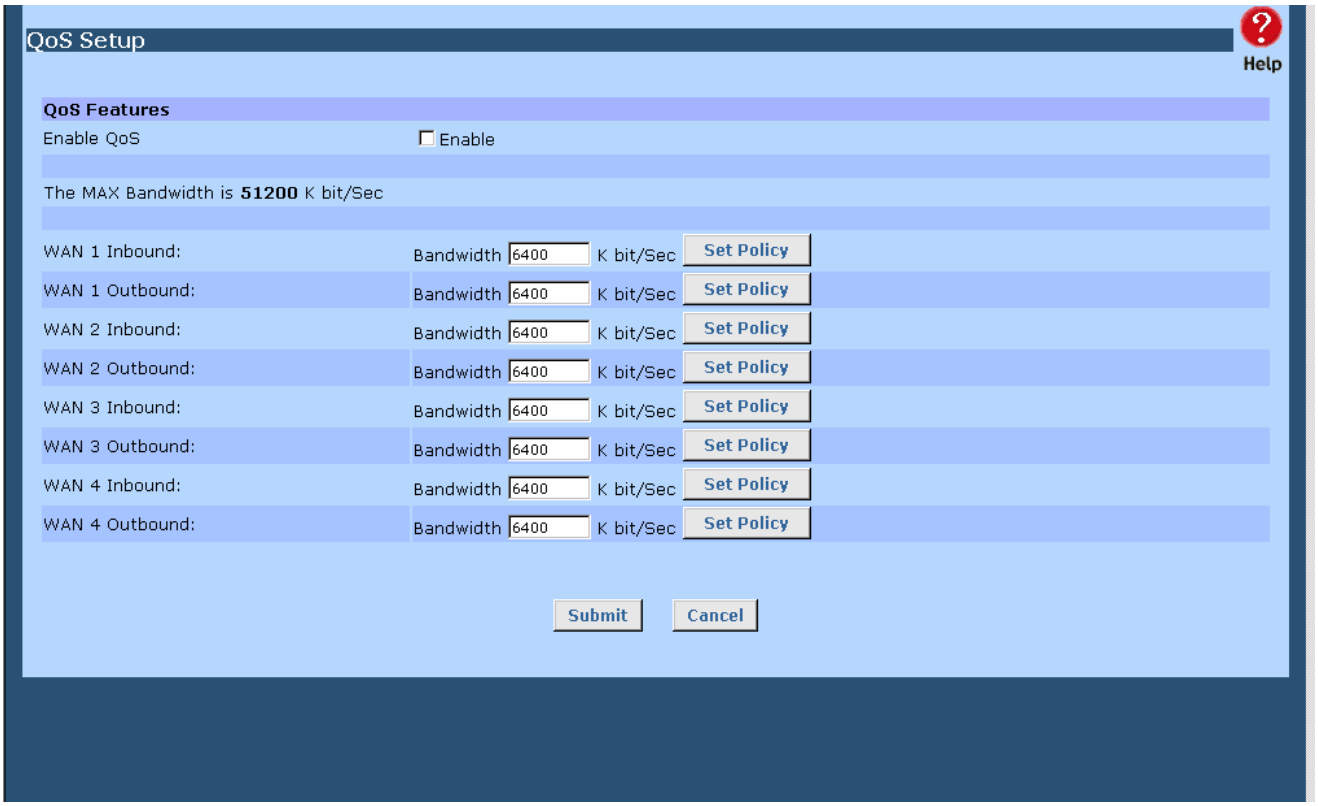

Figure 8-1: Bandwidth Setup

Settings – QoS Setup.

QoS Feature	• **Enable QoS** – Checkbox allows users enable QoS mechanism. If set to "enable" QoS. QoS will allocate Inbound/Outbound bandwidth to pass through the device. • **WAN Inbound / Outbound Bandwidth** –This allows you to set the maximum inbound or outbound bandwidth, maximizing your network's performance. This information can be obtained from your ISP • **Set Policy Button** –Setting the policy can allocate Inbound/Outbound bandwidth (based on your configuration) to pass through this device.

Policy Configuration

Setting the **QoS** policy can allocate Inbound/Outbound bandwidth (based on your configuration) to pass through this device. You can define some policies which classify received packets based on Local/Remote IP, MAC, port and protocol type. This feature is useful when the WAN link is very busy or congested or when using special applications that need real time services such as Internet phone, video conference...etc.

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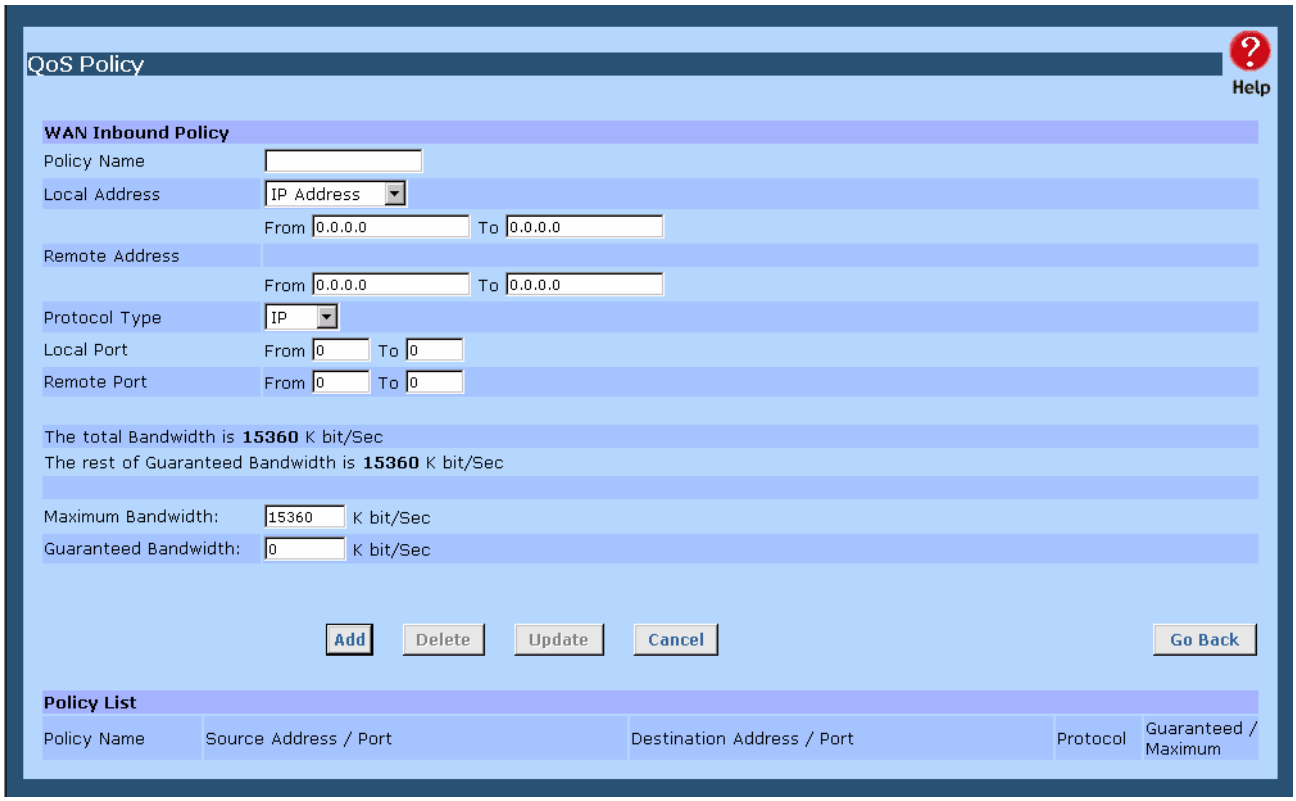


Figure 8-2: Policy Configuration

Settings – QoS Policy

WAN Inbound / Outbound Policy	• **Policy Name** –The name of a policy which is used to classify the received packets based on the following types for your memory • **Local / Remote Address, Port** –Specify a packet based on Local/Remote address or port. Address has two types: IP address and MAC address. By default, the IP address is 0.0.0.0 for all IP Addresses but the MAC address is 00-00-00-00-00-00 which cannot be used to classify. Port and Protocol Type define all packets for special applications • **Protocol Type** – The field defines traffic packet type, i.e. IP, TCP and UDP. • **Maximum Guaranteed Bandwidth** –This device supports Bandwidth queues. When a packet meets a policy rule requirement, it will be put into the responding queue. The queue will send them use the guaranteed bandwidth. If the rest bandwidth is enough it will try to arrive the maximum bandwidth.

Teaching setup Bandwidth control QoS:

The following is teaching you how to setup bandwidth control QoS.

(A)

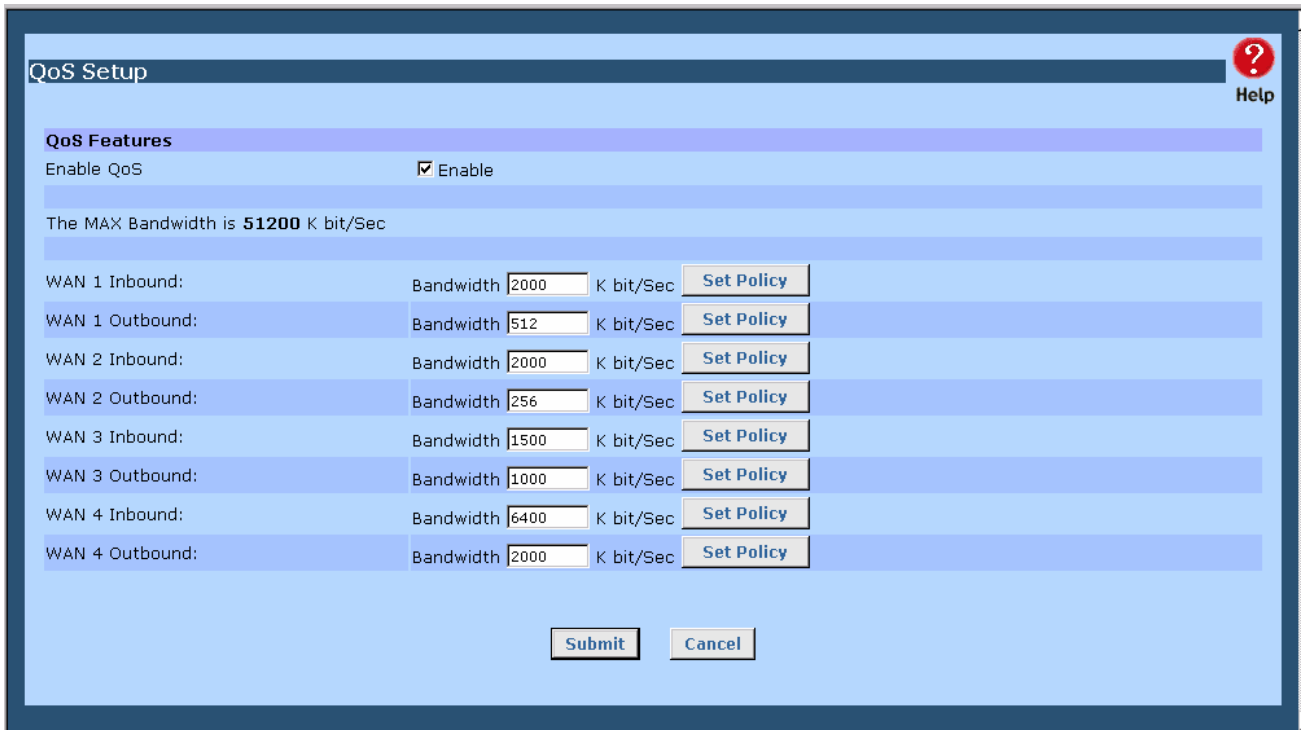


Figure 8-3: Policy Configuration

* 51200 k bit/Sec is the maximum bandwidth that device CPU can handle.

1. First, you have to “Enable” QoS, once you have enabled it. It will start QoS mechanisms.
2. From now on, you can dispatch the network bandwidth (inbound /outbound) to the WAN ports.

   By default, the device dispatches each WAN port for inbound & outbound is 6400 kbit/sec (51200/8)=6400 kbit/Sec. However, your local ISP provides the real bandwidth for each WAN bandwidth. Therefore, you fill-out the inbound & outbound bandwidth that your local ISP offer to you.
3. Once you fill-out each WAN port bandwidth, then you can move to the next step, setting up each WAN port inbound/outbound bandwidth policy.

(B)

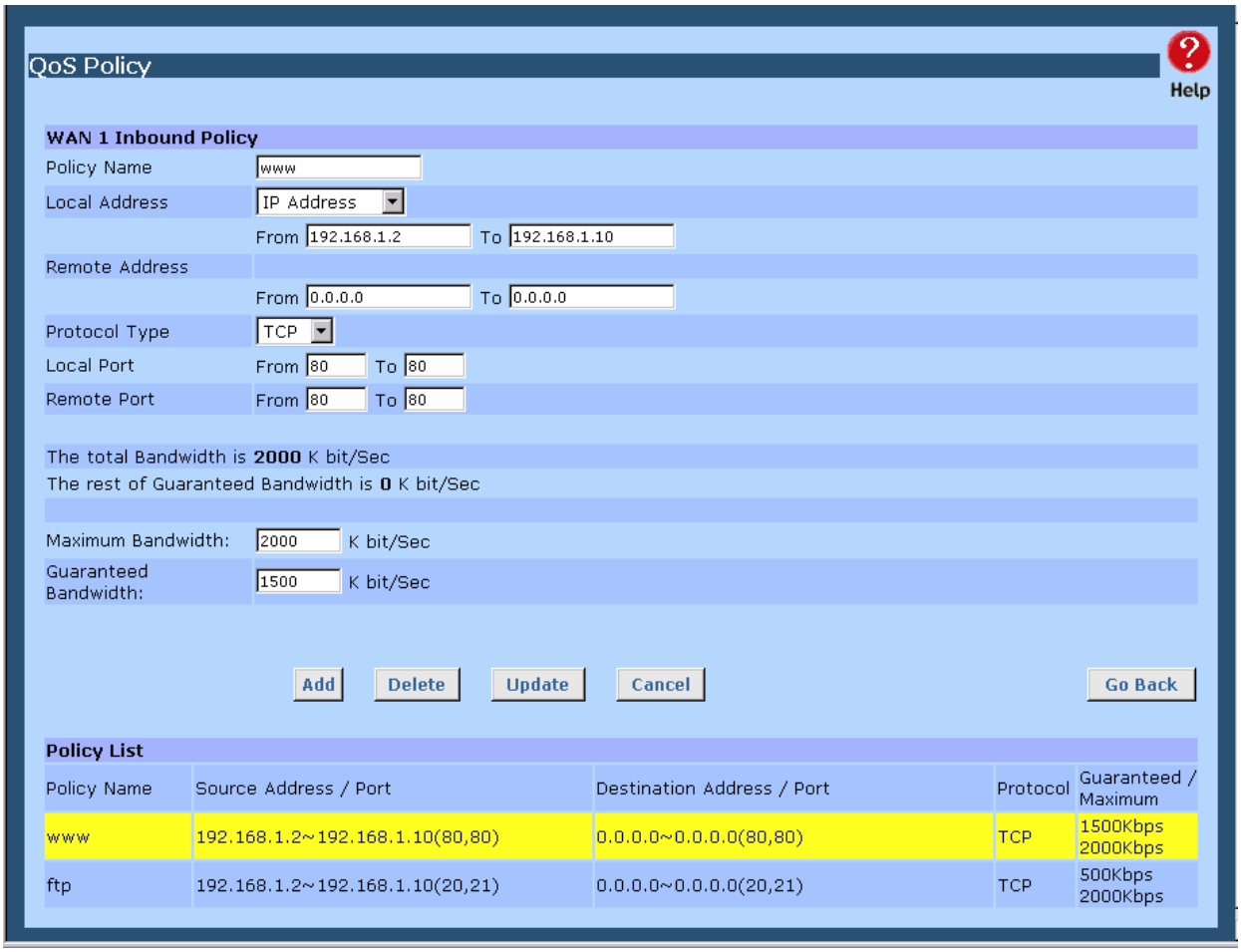


Figure 8-4: Policy Configuration

1. **Policy Name**: Give a name of your bandwidth control policy.
2. **Local Address:** It is you LAN side IP address. (by default 0.0.0.0 To 0.0.0.0 mean all local LAN IP addree) If you choose MAC (00-00-00-00-00-00) by pull-down menu does not mean all local MAC address.
3. **Protocol type and local/remote port**: Port and Protocol Type define all packets for special applications.
4. **The total Bandwidth** is the WAN port bandwidth that you define on your WAN port previously.
5. **Guaranteed Bandwidth** is the Bandwidth that you specified by your application (WWW, FTP, etc…)

*** Maximum / Guaranteed Bandwidth:**

This device supports Bandwidth queues. When a packet meets a policy rule requirement, it will be put into the responding queue. The queue will send them using the guaranteed bandwidth. If the rest bandwidth is enough it will try to arrive the maximum bandwidth.

6. Go back, and step by step setting up each WAN port inbound and out bound bandwidth policy for your application.

9: DNS Configuration

Overview

DNS configuration sed if you want to use **Incoming Load Balance** mechanism in your network environment. You must know how to change IP addresses of your DNS server to WAN any port IP addresses of a device which will replace your DNS server; make DNS requests to redirect to this device (e.g. set A, NS, CNAME, MX) and set SOA resource records in the Configure DNS & Map Host URL pages.

Configure DNS

In order to make inbound load balance work, users have to construct some server behind the LAN side of the 2 WAN ports router. It is also necessary for users to register a domain name with two WAN1/2 IP addresses in the “Domain Name Organization” for Static DNS.

Note

Once you have constructed some server and registered a domain name. You can make inbound load work through the following web pages setup.

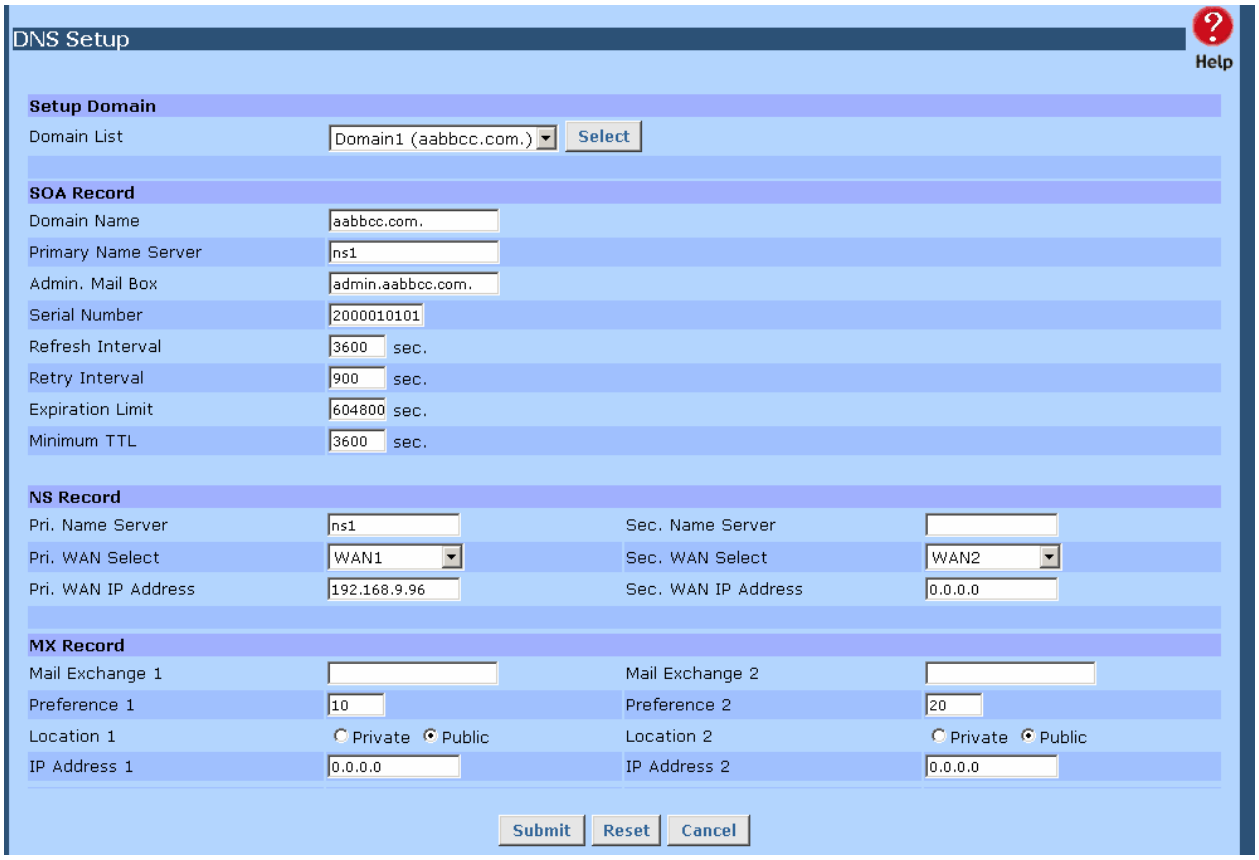


Figure 9-1: DNS Configuration

DNS Configuration

Setup Domain	**Domain List** – The device supports multi-domains.
SOA (Start Of Authority) Record	• **Domain Name/Primary Name Server** –These are fully qualified domain names (FQDN). e.g. www.xyz.com. It should terminate with a dot (**.**), otherwise the domain name will be added after it. • **Admin. Mail Box** –Email address for the domain administrator. You should use dot(.) to replace the at symbol(@) in the mail address. e.g. if Email address is super@xyz.com.tw. you should fill it as super.xyz.com. • **Serial Number/Refresh Interval/Retry Interval/Expiration /Minimum TTL** –These are referenced in RFC1035 or set by the default value.
NS (Name Server) Record	• **Pri. Name Server/Sec. Name Server** –IP Address of your DNS server. • **Public WAN IP Address** –By default, this is: 0.0.0.0. This device will use the current WAN port IP address the same as DNS index. e.g. DNS1 Pri./Sec. Name Server used WAN1/WAN2, otherwise enter a public IP addresses provided by the ISP
MX (Mail Exchange) Record	• **Mail Exchange** –FQDN for this mail server • **Preference** –Preference is the priority order, 0 being the highest priority. • **Location/IP Address** –Select Private and fill IP Address with its private address if mail server is inside your LAN. Otherwise select Public and fill-in its public IP Address.

Map Host URL

Other than set up DNS configuration, It is necessary for users to select an URL to map to the IP address of a local host. It is the URL to be mapped. Its FQDN is the combination of URL and domain name.

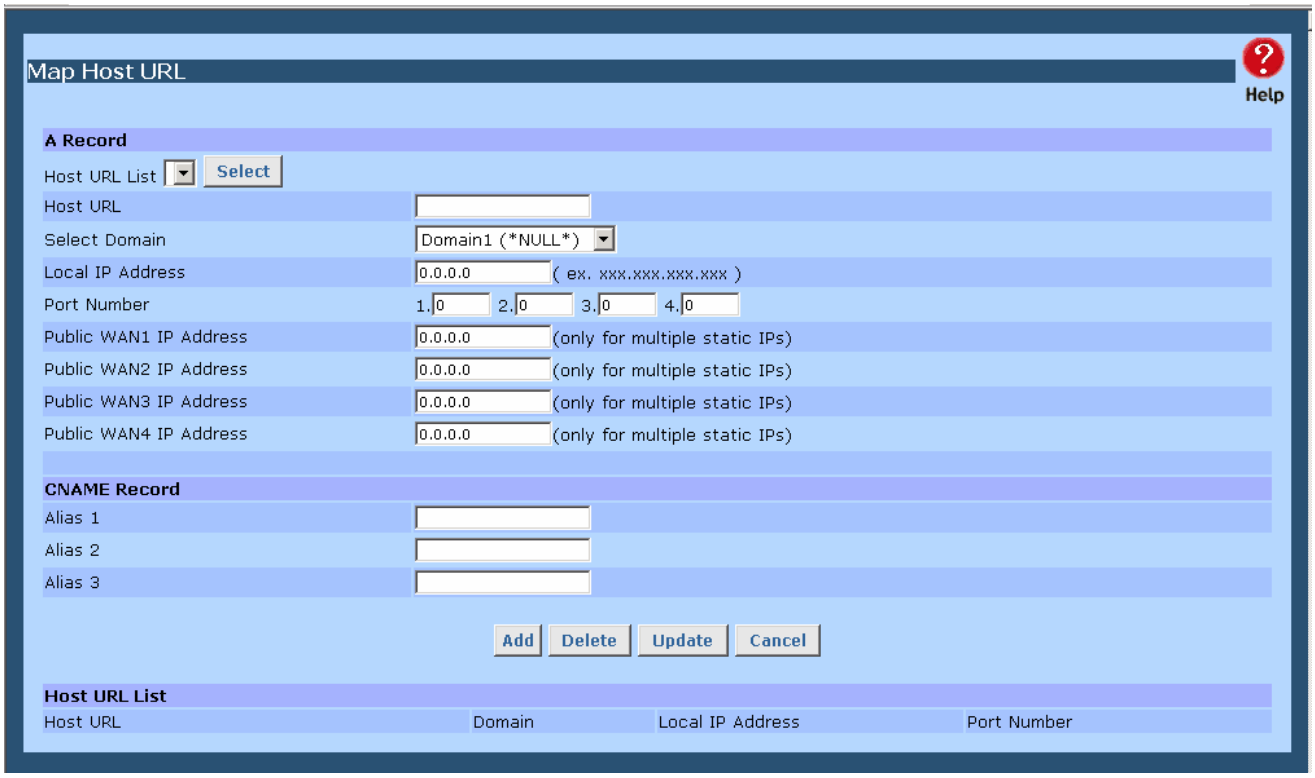


Figure 9-2: Map Host URL

Map Host URL

A Record	• **Host URL List** –You select a URL to map to the IP address of a local host. • **Host URL** –The URL to be mapped. If its value is "www" and domain name is xyz.com. its FQDN is the combination of URL and domain name (www.xyz.com.). • **Local IP Address** – It is the IP address of local host. • **Port Number** – The port number of all incoming packets are accepted and processed by a local host with the specified private IP address • **Public WAN1/2/3/4 IP address** – Used based on incoming load balance, if your ISP supports multiple static IP addresses for any WAN port; otherwise leave it blank. By default, it will use your current WAN port IP address for incoming load balance
CNAME Record	• **Canonical Name** – It is the alias host's URL.

10: Management Assistant

Overview

The following advanced features are provided:

- Admin. Setup
- Email Alert
- SNMP
- Syslog
- Upgrade Firmware

This chapter contains details of the configuration and use of each of these features.

Admin. Setup

Remote Access Configuration – This feature allows you to manage the Multi-WAN VPN Link Balancer via the Internet. You can restrict access to a specified IP address or address range.

Administrator Password – This feature allows you to assign a password for remote upgrade and access to the Multi-WAN VPN Link Balancer.

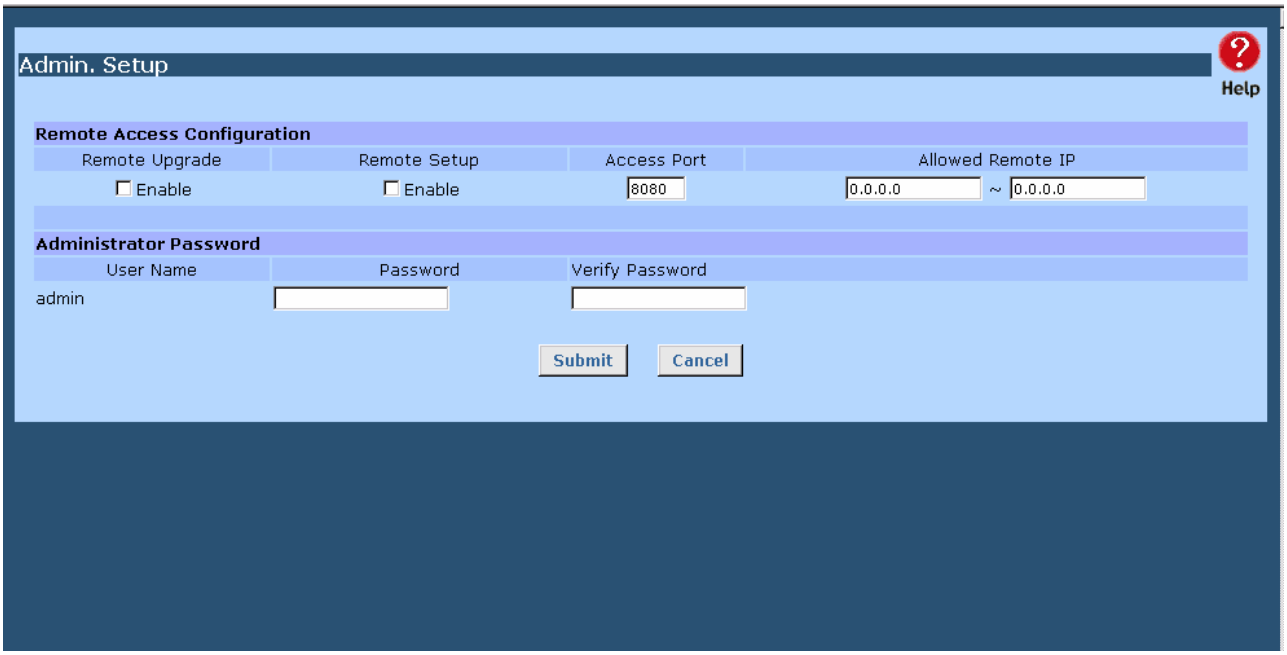


Figure 10-1: Admin. Setup

Settings – Admin. Setup

Remote Access Configuration	• **Remote Upgrade** – If enabled, you can use the supplied Windows utility to remotely upgrade the firmware. If not enabled, the upgrade must be performed by a PC on the LAN. • **Remote Setup** – If enabled, access to the web-based interface is available via the Internet (See below for details). If not enabled, access is only available by a PC on the LAN. • **Access port** – The port number used when connecting remotely. The default port number is 8080. • **Allowed Remote IP** – Remote access is only available to the IP address entered here. 1. Leaving these fields blank (0.0.0.0 ~ 0.0.0.0), will allow access by all PCs. 2. These addresses must be Internet IP addresses; not addresses on the local LAN. 3. To specify a single address, enter it in both fields.
Administrator Password	You can modify the device password in this field. The default entry is " " (no password).

Using Remote Web-based Setup

To connect to the Multi-WAN VPN Link Balancer from a remote PC via the Internet:

1. Ensure that both your PC and the Multi-WAN VPN Link Balancer are connected to the Internet.
2. Open your Web Browser.
3. In the "Address" bar, enter "HTTP://" followed by the Internet IP Address of the Multi-WAN VPN Link Balancer. If the port number is not 80, then the port number is also required. (After the IP Address, enter ":" followed by the port number.)
   e.g.

   HTTP://123.123.123.123:8080

   - This example assumes that the WAN IP Address is 123.123.123.123 and the port number is 8080.
   - If using the ***Dynamic DNS*** feature, you can connect using the domain name allocated to you.
     e.g.

     HTTP://my_domain_name.dyndns.org:8080

Management password

Enter the desired password, re-enter it in the *Verify Password* field, then save it.

When you connect to The VPN Link Balancer with your Browser, you will be prompted for the password when you connect, as shown below.

Figure 10-2: Password Dialog

- Enter "Admin" for the *User Name*.
- Enter the password for The VPN Link Balancer, as set on the *Admin Password* screen above.

Email Alert

This feature will send a warning Email to the system administrator when any WAN port is disconnected, has received excessive ping flooding, exceeded session limitation, etc.

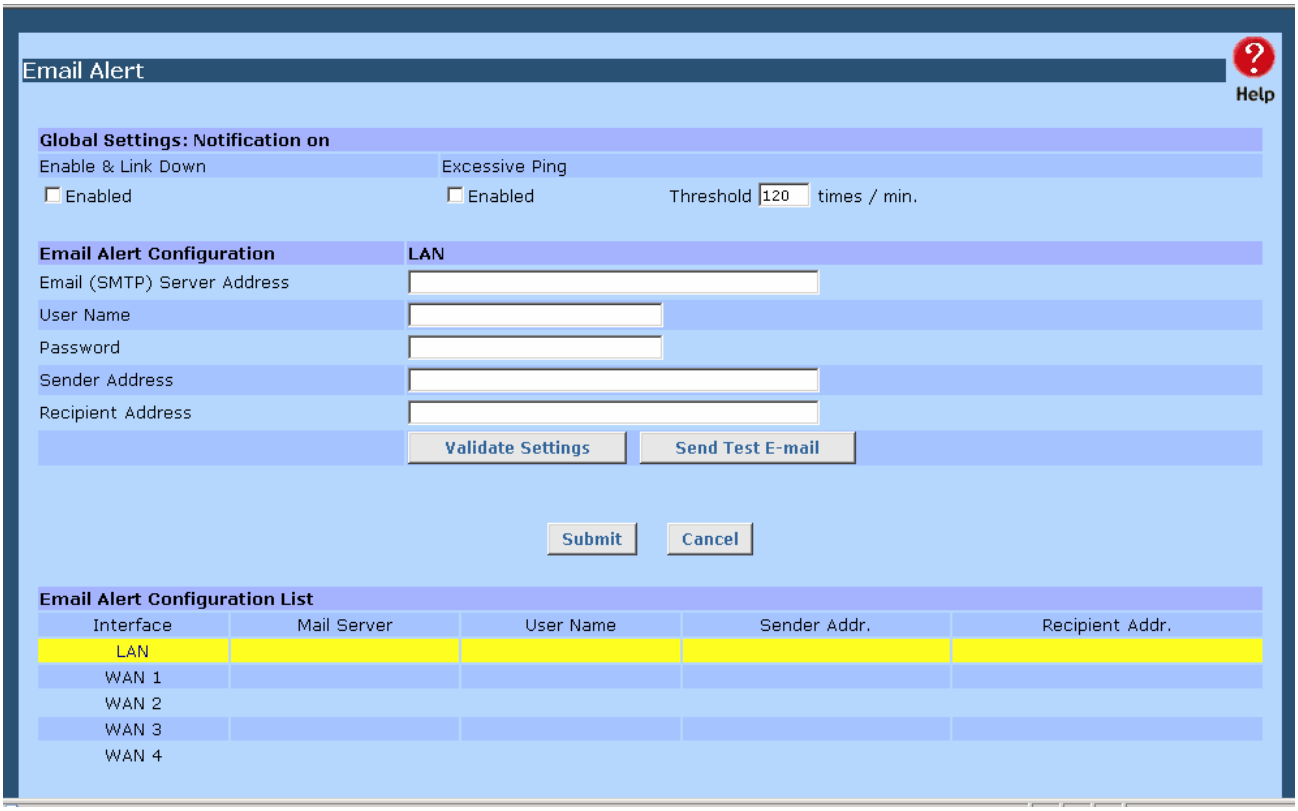


Figure 10-3: Email Alert

Settings – Email Alert

Global Setting	• **Enable & Link down** – To enable or disable the Alert Mail sending in the event one of the WAN ports is disconnected. • **Excessive ping** –This function is useful to prevent ICMP packets attacks from WAN or LAN onk the device. It will drop the packets if the ping times exceed the threshold value

Email Alert Configuration	The purpose of email alert is in the event a WAN port is disconnected or mal-functions, it will send an email message to inform the recipient. • **Email (SMTP) Server Address** – The e-mail server address. (ex: mail.yourdomain.com) • **User Name** –The user name of an e-mail sender address for authentication. (ex: abc) • **Password** –The password of an e-mail sender address for authentication. (ex:12345) • **Sender Address** – The email address of the sender. • **Recipient Address** –The email address of the receiver. (ex: .admin@yourdomain.com)
Email Alert Configuration list	List Email Alert messages that you have configured previously.

- If E-mail server is on LAN site, then SMTP server should fill-out E-mail server IP address (ex. 192.168.1.x) address.
- If E-mail server is on LAN site, and SMTP server is using domain name instead of IP address, then you should enable “DNS loop-back” under advanced web page before make it work

SNMP

This section is only useful if you have SNMP (Simple Network Management Protocol) software on your PC. If you have SNMP software, you can use a standard MIB II file with the Multi-WAN VPN Link Balancer.

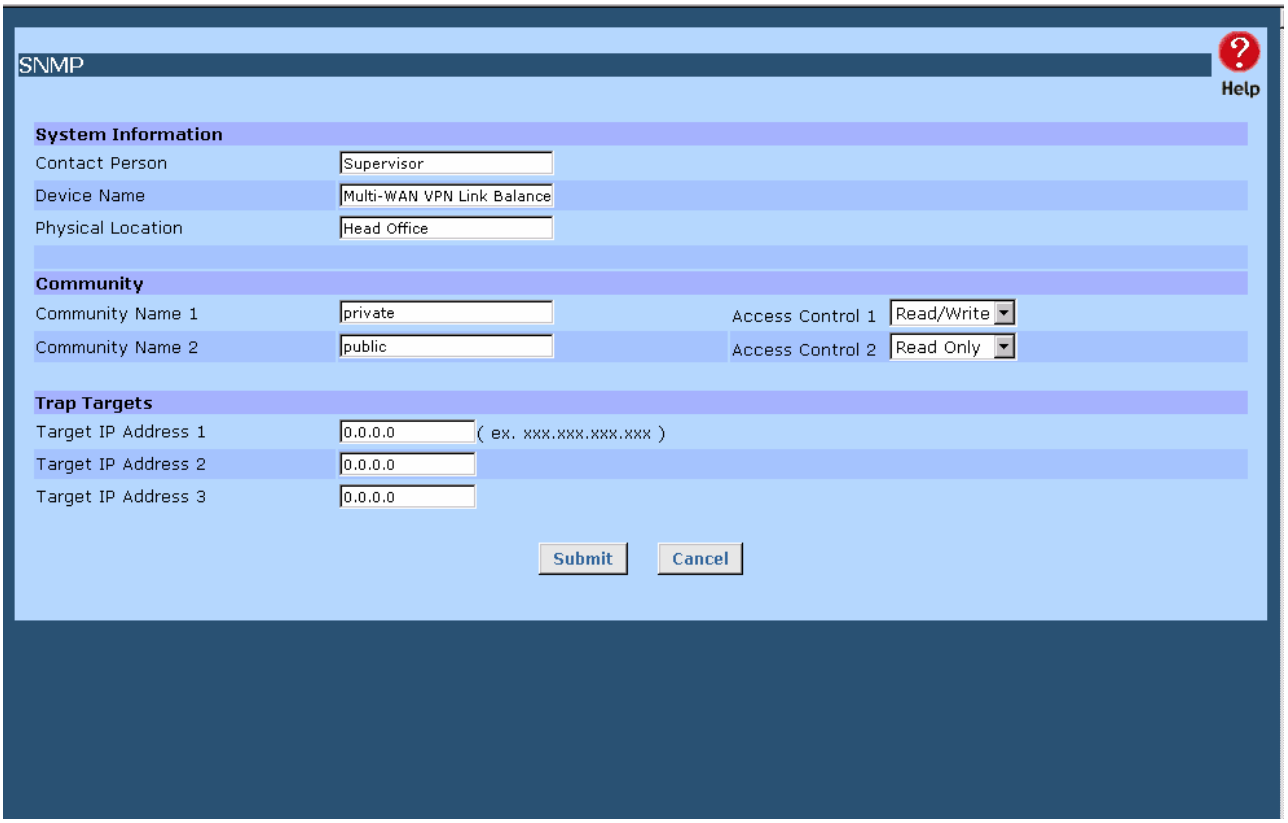


Figure 10-4: SNMP

Settings – SNMP

System Information	• **Contact Person** – The name of the person responsible for this device. • **Device name** – The name of this device. • **Physical Location** – The location of the device.
Community	• **Community Name** – This is a password or key used between this device and the management station. The administrator/manager must use the same name when monitoring the device. • **Access Control** – Access privileges which allow the management station to manage this device. This value may be: Read/Write, Read Only or No Access.
Trap Targets	Enter the IP addresses of any targets (PCs running SNMP software) to which you want traps to be sent. All traps are level 1.

Syslog

This feature can send the real time system information to a web page or to specified PCs.

Syslog Configuration – Syslog Configuration allows you to select whether to send the system information to another machine or not. Up to three machines can be chosen to send the system log to.

Message Status – Messages are only sent and kept when “Keep Sent Message” is enabled. Currently 100 messages are retained in RAM and will be cleared when the system is rebooted or powered off.

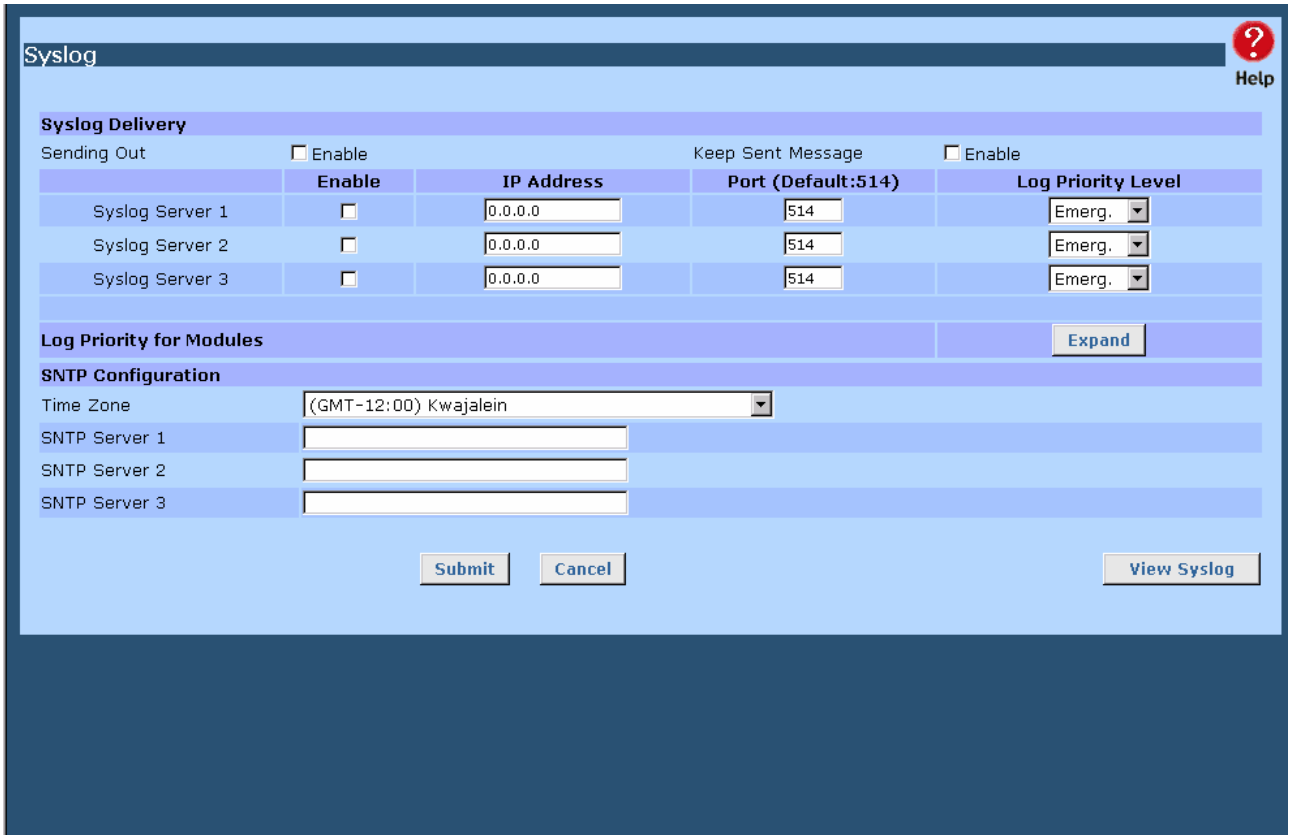


Figure 10-5: Syslog

Settings – Syslog

Syslog Delivery	• **Sending Out** – Set to "*Enable*", if you want to send system log messages to other machines (PCs).
	• **Keep Sent Message** – If set to Enable, it means you want to keep sent messages; otherwise the sent messages will be deleted.
	• **Syslog Server** – Up to 3 syslog servers can be used.
	  • **IP Address**: The IP address(es) of the syslog server(s) that you want to send to.
	  • **Port**: If your syslog server does not use the default port, you can change it.
	  • **Log Priority Level**: The syslog messages are divided into 8 levels from Emergency to Debug. The lower the level, the more messages will be generated. Emergency is the highest priority level and Debug is the lowest.

Log Priority for Modules	By pressing the "Expand" button, selection can be made as to which syslog module and level should be sent to the syslog server**.** You can arrange all items on a line by pressing the "Collapse" button.
SNTP (Simple Network Time Protocol) Configuration	SNTP is an Internet protocol to synchronize the computer (device) clock. You can select your location from the pull-down menu and fill in the SNTP server's IP address. The local clock will then synchronize with your device which updates with the correct time received from the SNTP server, then adds the Time Zone.

Upgrade Firmware

The Upgrade Firmware Screen allows you to upgrade the firmware or backup the system configuration.

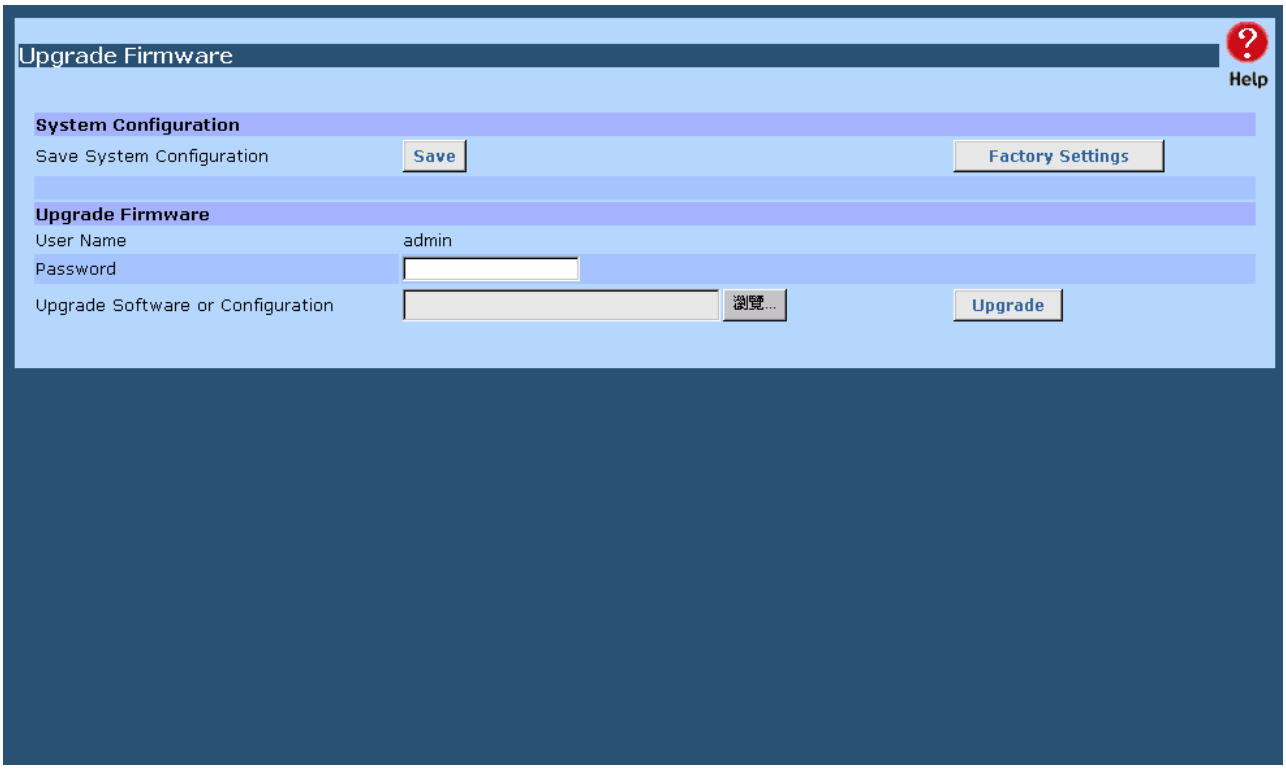


Figure 10-6: Upgrade Firmware

- You can backup your system configuration by pressing the Save System Configuration “Save” button. This will save the system configuration for future use.
- You also can upgrade the firmware by inputting the correct password, browsing to the firmware upgrade file and then pressing the “Upgrade” button. Do not reset or restart the device while updating the firmware as this may cause the system to crash.
- Pressing the “Factory Settings” button will reset the configuration data to its default value.

11: Network Info

Operation

Once the Multi-WAN VPN Link Balancer and the PCs are configured, operation is automatic. However, there are some situations where additional Internet configuration may be required. Refer to *Chapter 4 - Advanced Setup* for further details.

System Status

Use the ***System Status*** link on the main menu to view this screen.

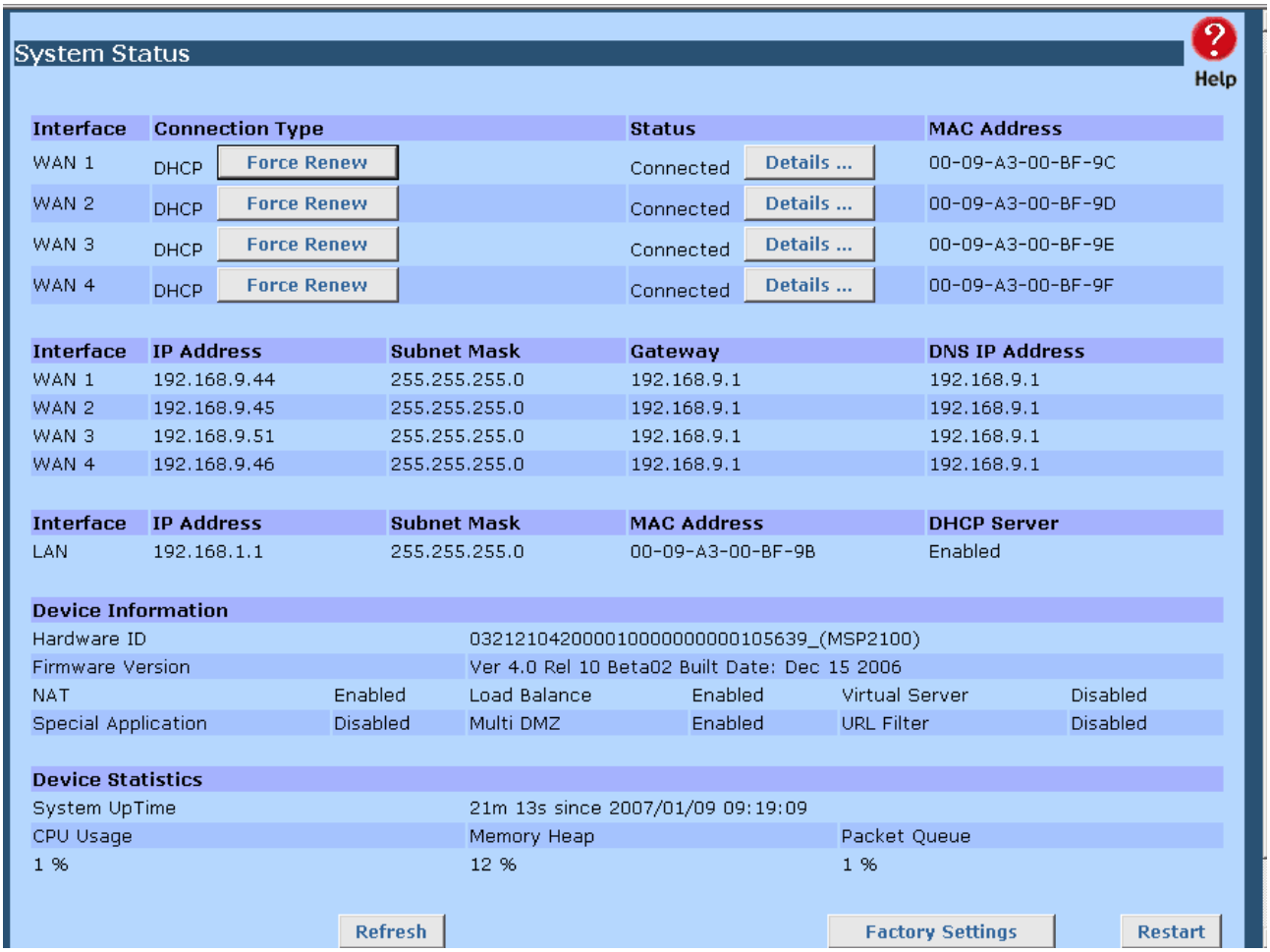


Figure 11-1: System Status

System Status

WAN Interface	• **Connection Type** – The type of connection used – DHCP, Fixed IP, PPPoE or PPTP. • **Connection Status** – Either "Connected" or "Disconnected". • **"Force Renew"** button– Only available if using a dynamic IP address (DHCP). Clicking this button will perform a DHCP "Renew" transaction with the ISP's DHCP server. This will extend the period for which the current WAN IP address is allocated to you. • **Connect/Disconnect** – Used for dial-up/connection of PPPoE or PPTP. • **IP Address** – The IP address of the Multi-WAN VPN Link Balancer, as seen from the Internet. This IP Address is allocated by the ISP (Internet Service Provider). • **Subnet Mask** – The Network Mask (Subnet Mask) for the IP Address above. • **Domain Name IP Address** – The address of the current DNS (Domain Name Server) • **Gateway** – The address of the Multi-WAN VPN Link Balancer gateway. • **MAC Address** – The MAC (physical) address of the Multi-WAN VPN Link Balancer, as seen from the Internet.
LAN Interface	• **IP Address** – The LAN IP Address of the Multi-WAN VPN Link Balancer. • **Subnet Mask** – The Network Mask (Subnet Mask) for the IP Address above. • **MAC Address** – The MAC (physical) address of the Multi-WAN VPN Link Balancer, as seen from the local LAN. • **DHCP Server** – The status of the DHCP Server function - either "Enabled" or "Disabled".
Device Information	• **Hardware ID** – The manufacturers ID for this particular device. • **Firmware Version** – Version of the Firmware currently installed. • **NAT** – Status of the *NAT* feature – either “Enable” or “Disable”. • **Load Balance** – Status of the *Load Balance* feature – either “Enable” or “Disable”. • **Virtual Server** – Status of the *Virtual Server* feature – either "Enabled" or "Disabled". • **Special Applications** – Status of the *Special Applications* feature – either "Enabled" or "Disabled". • **Multi DMZ** – Status of the Multi *DMZ* feature – either "Enabled" or "Disabled". • **Block URL** – Status of the *Block URL* feature – either “Enable” or “Disable”.

Device Statistics	• **System UpTime** – The time since the device system was last reinitialized. • **CPU Usage** – The current CPU percentage usage. • **Memory Heap** – The current Memory percentage usage (Heap & Queue). • **Packet Queue** – The current Packet Queue percentage usage.
Buttons	• **Refresh** – Updates the on-screen data. • **Restart** – Restarts (reboots) the Multi-WAN VPN Link Balancer. • **Restore Factory Defaults** – This will delete all existing settings and restore the factory default settings. See below for details.

Restore Factory Defaults

When the "Restore Factory Defaults" button on the ***Status*** screen above is clicked, the following screen is displayed:

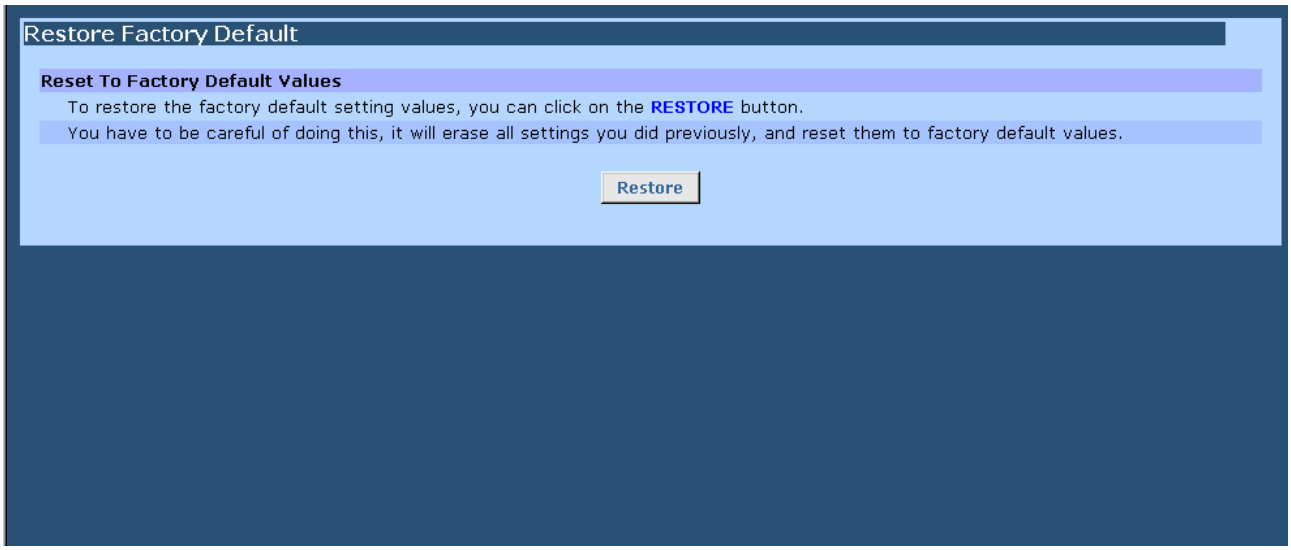

Restore Factory Default
Reset To Factory Default Values
To restore the factory default setting values, you can click on the RESTORE button.
You have to be careful of doing this, it will erase all settings you did previously, and reset them to factory default values.
Restore

Figure 11-2: Restore Factory Defaults

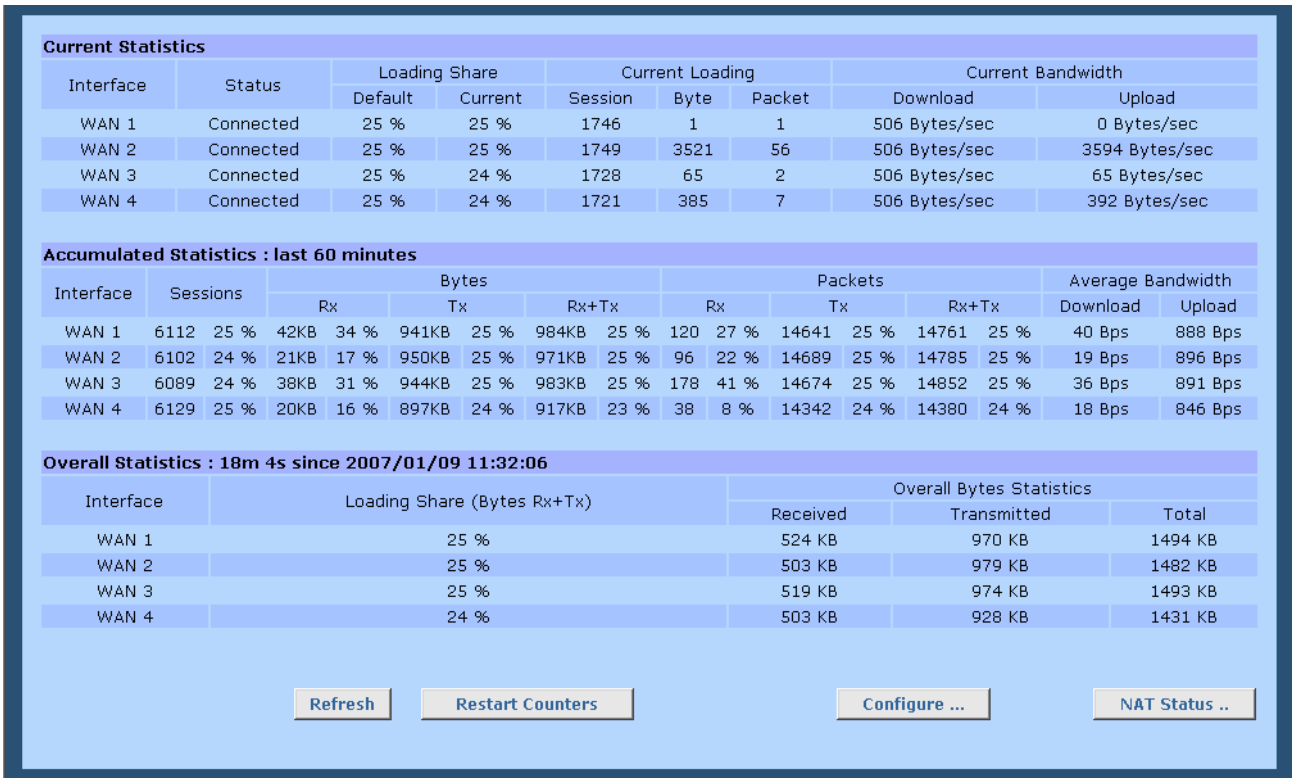
If the "Restore" button on this screen is clicked:

- ALL of your settings will be erased.
- The default IP address, password and all other settings will be restored to the factory default values.
- The DCHP server function will be enabled.

These changes may mean that the current connection is invalid and you will have to re-connect to the Multi-WAN VPN Link Balancer using its default IP address (192.168.1.1).

WAN Status

Use the ***WAN Status*** link on the main menu to view this screen.



Current Statistics

Interface	Status	Loading Share		Current Loading			Current Bandwidth	
		Default	Current	Session	Byte	Packet	Download	Upload
WAN 1	Connected	25 %	25 %	1746	1	1	506 Bytes/sec	0 Bytes/sec
WAN 2	Connected	25 %	25 %	1749	3521	56	506 Bytes/sec	3594 Bytes/sec
WAN 3	Connected	25 %	24 %	1728	65	2	506 Bytes/sec	65 Bytes/sec
WAN 4	Connected	25 %	24 %	1721	385	7	506 Bytes/sec	392 Bytes/sec

Accumulated Statistics : last 60 minutes

Interface	Sessions		Bytes						Packets						Average Bandwidth	
			Rx		Tx		Rx+Tx		Rx		Tx		Rx+Tx		Download	Upload
WAN 1	6112	25 %	42KB	34 %	941KB	25 %	984KB	25 %	120	27 %	14641	25 %	14761	25 %	40 Bps	888 Bps
WAN 2	6102	24 %	21KB	17 %	950KB	25 %	971KB	25 %	96	22 %	14689	25 %	14785	25 %	19 Bps	896 Bps
WAN 3	6089	24 %	38KB	31 %	944KB	25 %	983KB	25 %	178	41 %	14674	25 %	14852	25 %	36 Bps	891 Bps
WAN 4	6129	25 %	20KB	16 %	897KB	24 %	917KB	23 %	38	8 %	14342	24 %	14380	24 %	18 Bps	846 Bps

Overall Statistics : 18m 4s since 2007/01/09 11:32:06

Interface	Loading Share (Bytes Rx+Tx)	Overall Bytes Statistics		
		Received	Transmitted	Total
WAN 1	25 %	524 KB	970 KB	1494 KB
WAN 2	25 %	503 KB	979 KB	1482 KB
WAN 3	25 %	519 KB	974 KB	1493 KB
WAN 4	24 %	503 KB	928 KB	1431 KB

Refresh | Restart Counters | Configure ... | NAT Status ..

Figure 11-3: WAN Status

WAN Status

Current Statistics	Current loading share for WAN1, WAN2, WAN3, WAN4
Accumulated Statistics	The statistics for calculate WAN1 to WAN4 packets with a period of time. User can define the time period throu load balancing web page setup
Overall statistics	Overall loading share (receive & transmit) packets for WAN1, WAN2,WAN3 & WAN4

NAT Status

This screen is displayed when you click the "Check NAT Detail" button on the ***WAN Status*** screen.

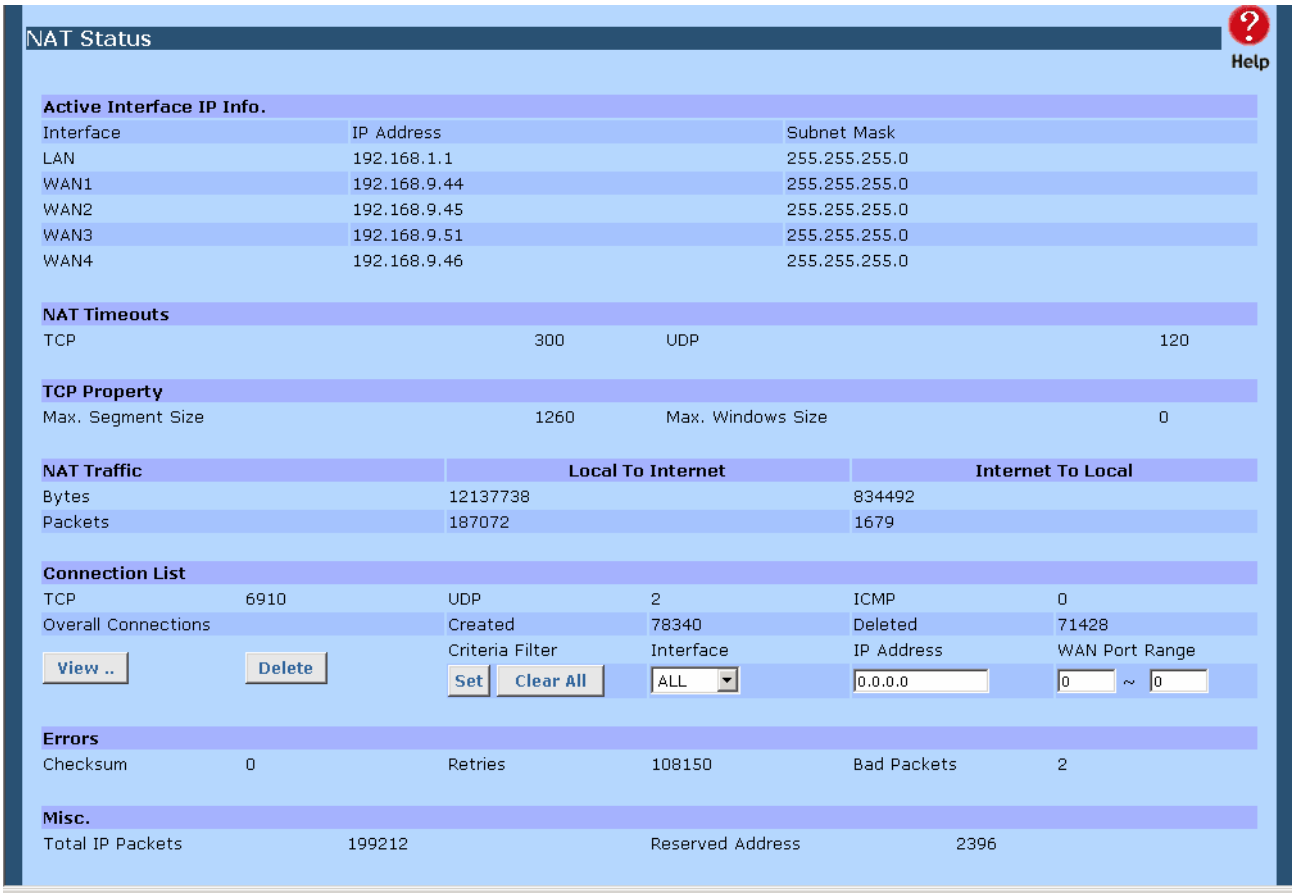


Figure 11-4: NAT Status

Data – NAT Status

Active Interface IP Info	• **Interface** – LAN and WAN interface of the VPN Link Balancer. • **IP Address** – The WAN (Internet) & LAN IP Address of the VPN Link Balancer. • **Subnet Mask** – The Network Mask (Subnet Mask) for the IP Address above
NAT Timeouts	This displays the current timeout values for TCP and UDP connections.
TCP Prosperity	This displays the MSS (Maximum Segment Size) and Maximum Windows size for TCP packets.
NAT Traffic	This section displays statistics for both outgoing (LAN to Internet) and Incoming (Internet to Local) traffic.
Connections List	This displays the current number of active connections. For further details, click the "View Connection" list button.
Errors	Statistics are displayed for Checksum errors, number of retries, and number of bad packets.
Misc.	This displays the total IP packets and reserved address.

Appendix A
Specifications

Model	Multi-WAN VPN Link Balancer
Dimensions	423mm (W) x 155mm (D) x 43mm (H)
Operating Temperature	0° C to 40° C
Storage Temperature	-10° C to 70° C
Network Protocol:	TCP/IP
Network Interface:	16 *10/100 BaseT (RJ45) Auto-switching Hub ports for WAN / LAN devices.
LEDs	1 power LED. 2 status LEDs. 16 LEDs for WAN/LAN
Power Supply	Internal AC 100V ~ 240V / 50 ~ 60 Hz

FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

Tested to comply with FCC Standards for Home or Office use.

CE Marking Warning

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Appendix B
Windows TCP/IP Setup

Overview

TCP/IP Settings

If using the default Multi-WAN VPN Link Balancer settings and the default Windows 95/98/ME/2000 TCP/IP settings, no changes need to be made.

- By default, the Multi-WAN VPN Link Balancer will act as a DHCP Server, automatically providing a suitable IP Address (and related information) to each PC when the PC boots.
- For all non-Server versions of Windows, the default TCP/IP setting is to act as a DHCP client.
- If you wish to check your TCP/IP settings, the procedure is described in the following sections.
- If your LAN has a router, it must be reconfigured by the LAN Administrator.

Checking TCP/IP Settings - Windows 9x/ME:

1. Select *Control Panel - Network*. You should see a screen like the following:

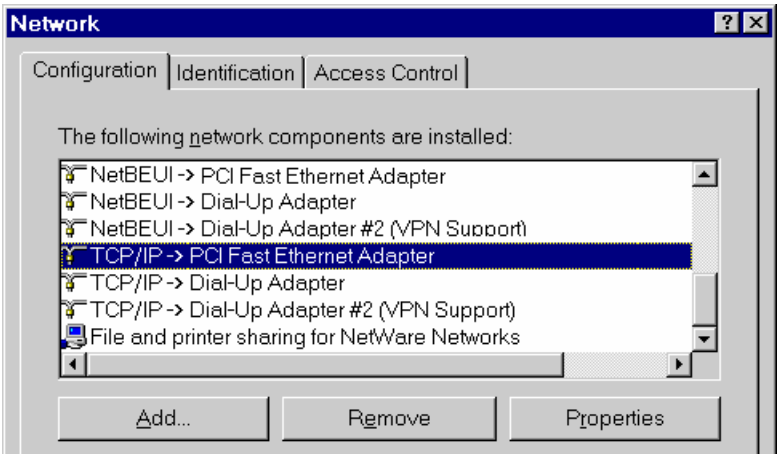


Figure B-1: Network Configuration

2. Select the *TCP/IP* protocol for your network card.
3. Click on the *Properties* button. You should then see a screen like the following:

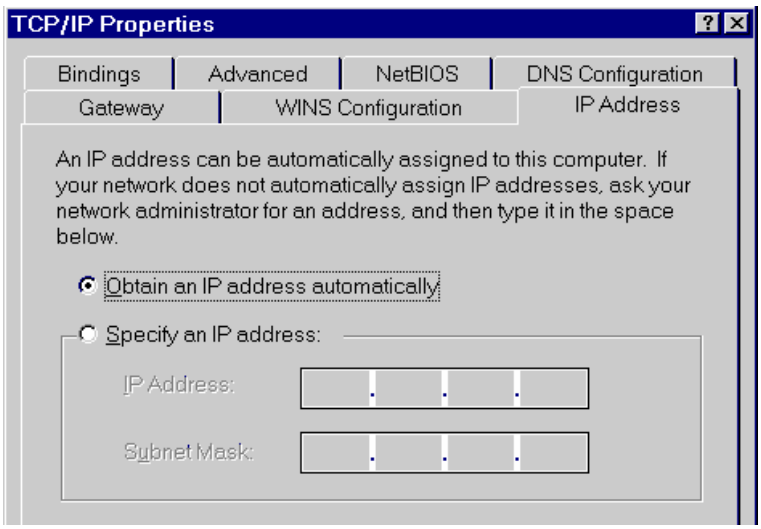

TCP/IP Properties
Bindings
Advanced
NetBIOS
DNS Configuration
Gateway
WINS Configuration
IP Address
An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.
Obtain an IP address automatically
Specify an IP address:
IP Address:
Subnet Mask:

Figure B-2: IP Address (Win 95)

Ensure your TCP/IP settings are correct as follows:

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows setting.

Restart your PC to ensure it obtains an IP Address from the Multi-WAN VPN Link Balancer.

Using "Specify an IP Address"

If your PC is already configured, check with your network administrator before making the following changes:

- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.
- On the *Gateway* tab, enter the Multi-WAN VPN Link Balancer's IP address in the *New gateway* field and click *Add*, as shown below. (Your LAN administrator can advise you of the IP Address assigned to the Multi-WAN VPN Link Balancer.)

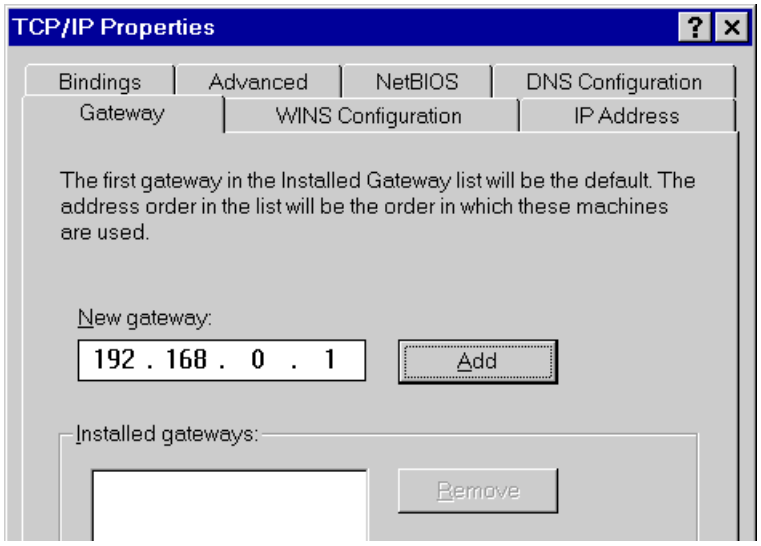


Figure B-3: Gateway Tab (Win 95/98)

- On the *DNS Configuration* tab, ensure *Enable DNS* is selected. If the *DNS Server Search Order* list is empty, enter the DNS address provided by your ISP in the field beside the *Add* button, then click *Add*.

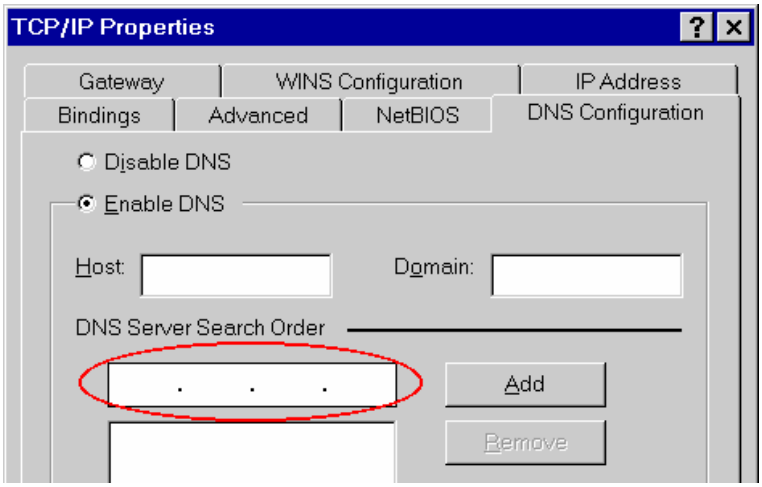


Figure B-4: DNS Tab (Win 95/98)

Checking TCP/IP Settings - Windows 2000:

1. Select *Control Panel - Network and Dial-up Connection*.
2. Right click the *Local Area Connection* icon and select *Properties*. You should see a screen like the following:

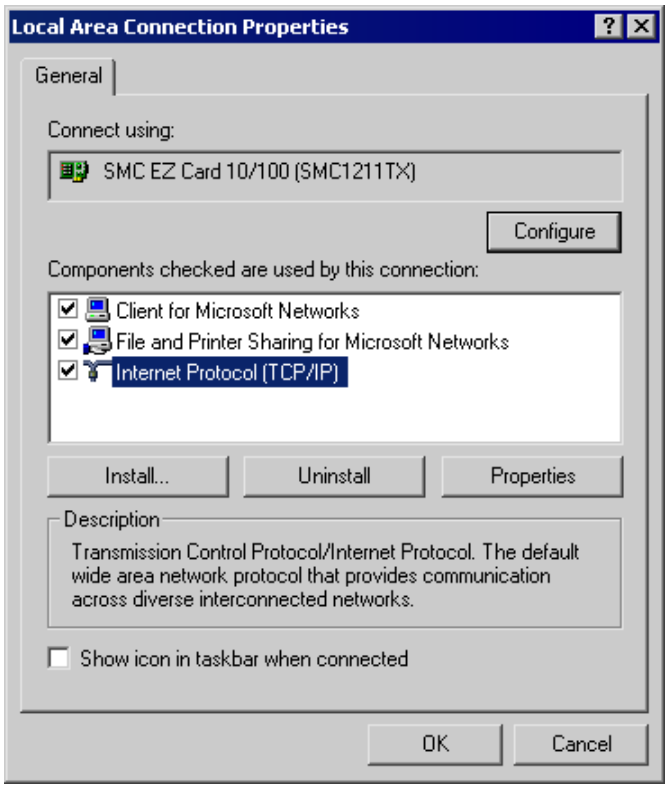


Figure B-5: Network Configuration (Win 2000)

3. Select the *TCP/IP* protocol for your network card.
4. Click on the *Properties* button. You should then see a screen like the following:

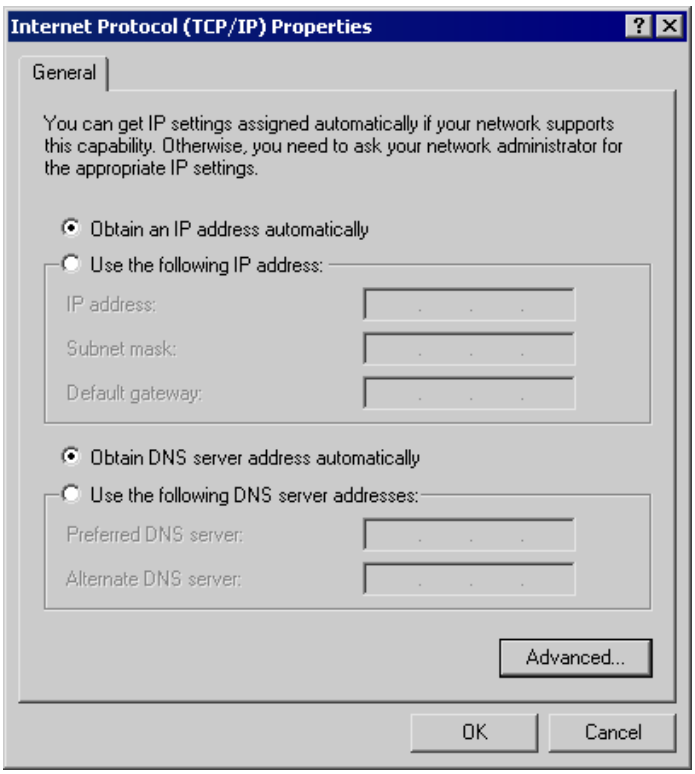

Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure B-6: TCP/IP Properties (Win 2000)

5. Ensure your TCP/IP settings are correct:

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows setting.

Restart your PC to ensure it obtains an IP Address from the Multi-WAN VPN Link Balancer.

Using a fixed IP Address ("Use the following IP Address")

If your PC is already configured, check with your network administrator before making the following changes:

- Enter the Multi-WAN VPN Link Balancer's IP address in the *Default gateway* field and click *OK*. (Your LAN administrator can advise you of the IP Address assigned to the Multi-WAN VPN Link Balancer.)
- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.

Checking TCP/IP Settings - Windows XP:

1. Select Control Panel - Network Connection.
2. Right click the *Local Area Connection* and choose *Properties*. You should see a screen like the following:

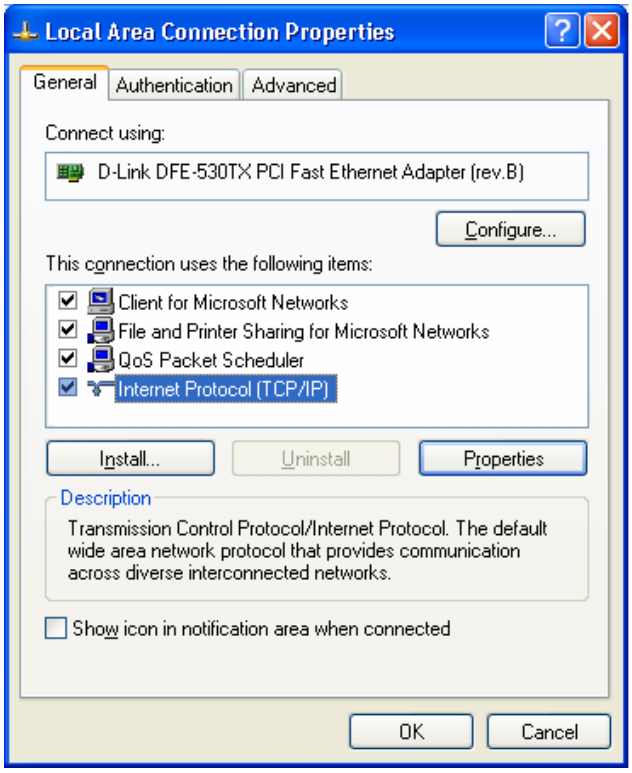


Figure B-7: Network Configuration (Windows XP)

3. Select the *TCP/IP* protocol for your network card.
4. Click on the *Properties* button. You should then see a screen like the following:

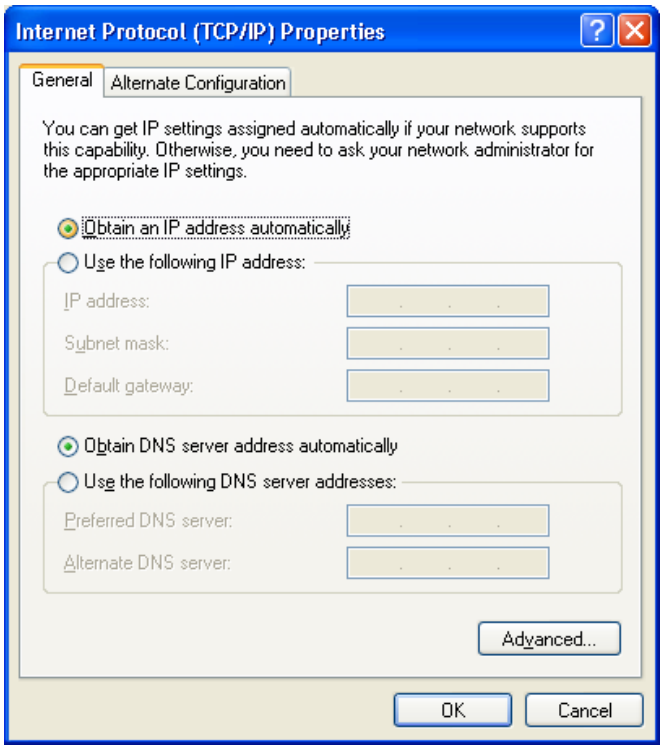

Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

Figure B-8: TCP/IP Properties (Windows XP)

5. Ensure your TCP/IP settings are correct.

Using DHCP

To use DHCP, select the radio button *Obtain an IP Address automatically*. This is the default Windows setting.

Restart your PC to ensure it obtains an IP Address from the Multi-WAN VPN Link Balancer.

Using a fixed IP Address ("Use the following IP Address")

If your PC is already configured, check with your network administrator before making the following changes.

- Enter the Multi-WAN VPN Link Balancer's IP address in the *Default gateway* field and click *OK*. (Your LAN administrator can advise you of the IP Address assigned to the Multi-WAN VPN Link Balancer.)
- If the *DNS Server* fields are empty, select *Use the following DNS server addresses*, and enter the DNS address or addresses provided by your ISP, then click *OK*.

Appendix C

Troubleshooting

Overview

This chapter covers some common problems that may be encountered while using the Multi-WAN VPN Link Balancer and some possible solutions to them. If you follow the suggested steps and the Multi-WAN VPN Link Balancer still does not function properly, contact your dealer for further advice.

General Problems

Problem 1:	**Can't connect to the Multi-WAN VPN Link Balancer to configure it.**
Solution 1:	Check the following: • The Multi-WAN VPN Link Balancer is properly installed, LAN connections are OK, and it is powered ON. *By default, Port 1-2 of this device are WAN ports, the others are LAN ports. Otherwise you have changed Maximum WAN ports.* • Ensure that your PC and the Multi-WAN VPN Link Balancer are on the same network segment. (If you don't have a router, this must be the case.) • If your PC is set to "Obtain an IP Address automatically" (DHCP client), restart it. • If your PC uses a Fixed (Static) IP address, ensure that it is using an IP Address within the range 192.168.1.2 to 192.168.1.254 and thus compatible with the Multi-WAN VPN Link Balancer's default IP Address of 192.168.1.1. Also, the Network Mask should be set to 255.255.255.0 to match the Multi-WAN VPN Link Balancer. In Windows, you can check these settings by accessing *Control Panel-Network* to check the *Properties* for the TCP/IP protocol.

Internet Access

Problem 1:	**When I enter a URL or IP address I get a time out error.**
Solution 1:	A number of things could be causing this. Try the following troubleshooting steps. • Check if other PCs are working. If they are, ensure that your PC's IP settings are correct. If using a Fixed (Static) IP Address, check the Network Mask, Default gateway and DNS as well as the IP Address. • If the PCs are configured correctly, but still not working, check the Multi-WAN VPN Link Balancer. Ensure that it is connected and ON. Connect to it and check its settings. (If you can't connect to it, check the LAN and power connections.) • If the Multi-WAN VPN Link Balancer is configured correctly, check your Internet connection (DSL/Cable modem etc.) to see if it is working correctly.

Problem 2:	**Some applications do not run properly when using the Multi-WAN VPN Link Balancer.**
Solution 2:	The Multi-WAN VPN Link Balancer processes the data passing through it, so it is not transparent. Use the *Special Applications* feature to allow the use of Internet applications which are not functioning correctly. If this does solve the problem, you can use the *DMZ* function. This should work with most applications, however: • It is a security risk, since the firewall is disabled for the *DMZ* PC. • Only one (1) PC can use this feature.